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TRANSACTIONS
OF THE
WISCONSIN ACADEMY
OF
SCIENCES, ARTS, AND LETTERS

EDITED BY THE SECRETARY

VOL. IX, PART II

1893

PUBLISHED BY AUTHORITY OF LAW



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DEMOCRAT PRINTING COMPANY, STATE PRINTER

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GEOLOGY OF THE WATERLOO QUARTZITE AREA.

(WITH PLATES VII-IX).

BY IRA M. BUELL.

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INTRODUCTION.

The group of quartzite exposures that occurs in the midst of the Lower Silurian belt of southeastern Wisconsin, near the village of Waterloo, has an immediate local interest as the most remote group of outliers of the Lake Superior pre-Cambrian area, and as the nearest examples of crystalline rocks to the capital of the state. Their peculiar structural types, and relations to adjacent paleozoic formations, and especially their relations to the quaternary formations, present features of general interest, and have caused them to receive considerable attention in geological literature. The first public mention of this area seems

to have been made in a lecture given by the late Dr. Lapham in Milwaukee in 1848.* This lecture probably afforded Dr. Owen the data for its first notice in geological literature, which reads as follows: "The late Mr. J. S. Thayer observed a locality of granite in Dodge county, Wisconsin, (Sec. 33, T. 9, R. 13, *West.*) It is nearly on a parallel of latitude with Painted Rock on the Mississippi and about one hundred miles east of these granite ridges on Black river and distant about one hundred and twenty miles from the Mississippi and between fifty and sixty miles from Lake Michigan."† The description indicates a complete misapprehension of the nature and correlations of the exposures which may be best explained perhaps by the indefinite nature of his information.

In Dr. Percival's report upon Wisconsin geology made in 1855, are two brief descriptions of the outcrops. He describes the ledges as occurring in two parallel ranges, one on the east side of a marsh traversed by Waterloo creek, and the other on the west side of a ridge about a mile farther east. He correctly locates two of the four areas described in this paper and associates them with the Baraboo quartzites, but errs in considering them to be metamorphosed strata of the Potsdam formation. His determination of the strike of the layers is south by east and the dip 20° east, which coincides with my determinations upon his eastern ledge area.

In the records of the Wisconsin Academy of Sciences brief mention is made of a paper on "The Metamorphic Rocks of Portland and Waterloo," ‡ which was read at one of its earliest meetings by the Rev. A. O. Wright. In this the author called attention to the rounded and striated surfaces of the outcrops and to the bowlder train extending southward from the main area. In the notes upon the discussion of the paper is the adoption of a resolution that the area be made the subject of scientific examination by a committee from the Academy. Apparently as an outcome of this is an extended note upon the topic by Dr. Irving which was published in 1871 in the *American Journal of Science*.§ This

*Dr. R. D. Irving in note in *Am. Jour. Science*, Vol. V, p. 282.

†Report on the Geology of Wisconsin, Minnesota and Iowa, p. 151.

‡Transactions Wis. Acad. Sciences, Vol. I, p. 189.

§*Am. Jour. Science*, Vol V, p. 282.

account contains a review of previous literature upon the subject together with the results of a brief examination of the district. The two areas recognized by Dr. Percival were here described as one. The rock was designated a quartzite, in places a metamorphic conglomerate with seams of talcosilicious schist. The layers were thought to incline to the N. N. E. at a high angle, but this and the strike were not satisfactorily made out. The adjacent sandstone was referred to the Potsdam as is the case with the Baraboo outcrops, but the formation was for the first time correctly referred with its companion range at Baraboo to the Huronian age.

The first detailed description of the area is found in the second volume of the reports upon the Wisconsin Geological Survey.* In the chapter describing the Archæan formations of the region, Dr. Chamberlin mentions three separate groups of outcrops and notes in each the principal ledges. He determined also their true relations to the adjacent sandstone, shales and conglomerates and the underlying Lower Magnesian and overlying Trenton limestone. The dip and strike of several of the outcrops were noted, but no attempt was made to correlate these observations. The occurrence of glacial striae on several of the ledge areas was noted, and in the chapter on the quaternary formations their importance as points of origin of extensive boulder trains was made prominent.† In two subsequent articles on the glacial geology of the region, published in the reports of the U. S. Geological Survey, President Chamberlin has briefly referred to these outcrops and indicated their boulder trains. In Dr. Irving's chapter in the Wisconsin report already referred to,‡ this area is briefly described and mapped with the other isolated outcrops of the region, the whole series being grouped with an outlying Huronian belt peripheral to the Archæan area. In this author's subsequent reports upon the crystalline rocks of the lake Superior region these relations are several times brought out.

The peculiar dynamic action to which these quartzites have

*Geology of Wisconsin, Vol. II, p. 252.

†Ibid, p. 202.

‡Ibid, p. 501.

been subjected was first pointed out to me by Prof. Van Hise, and to him is due the suggestion that the schistosity developed in these original clastics would be found to be a valuable means for the discrimination of this rock from other quartzites and its identification in the glacial drift.

My approach to the subject has been from the side of the relations of these quartzites to glacial phenomena, being interested in them chiefly as points of origin of boulder material which is disseminated through the glacial drift over a considerable area to the south, southwest and west of the ledges. In tracing out this distribution it has been found necessary to enter somewhat minutely into the geological relations of the series and to work out the structural features of the quartzite itself, these points being found essential in the consideration of the questions of glacial distribution. In this paper are presented only the results of these studies upon the constitution and structure of the rock forming the ledge exposures, but with the object in mind of subsequently using this knowledge as a substantial basis for the working out of their relations to the more recent stages of geological history.

FIELD NOTES.

General Geological Relations—The area including these exposures lies about twenty-five miles east of Madison in the southern part of Dodge county and in the northwestern township of Jefferson county. The outcrops all lie in a broad erosion basin formed from the layers of the St. Peters sandstones and the adjacent limestones. This basin is occupied superficially by broad marsh areas and is drained by the sluggish Crawfish river and its tributaries. The ledges therefore occupy a lower position than the drift-covered limestone ridges in the vicinity. The territory outlined by the exposures extends for about twelve miles in a direction west-southwest from its initial area to the northeast, and the southwest exposure lies about six miles from the opposite margin of the field. The three marginal areas may be considered as outlining a rude crescent within whose cusps the fourth area is included.

Descriptions of the Exposures—The four areas into which the ledges are grouped are designated as the Portland, Hubbellton, Lake Mills and Mud Lake areas. Two of these were recognized by Percival, the third was found by President Chamberlin in his study of the region, while the fourth was discovered during the course of my investigations. The first or Portland area lies within, and upon the eastern rim of the marsh drained by the terminal course of Waterloo creek. Rocky Island, its most northern exposure, is a ledge arising abruptly within a shallow lake at the junction of Waterloo creek with the Crawfish river on Sec. 27, Portland township. On three sides the bare, polished *roches moutonnees* rise directly from the water, but on the fourth margin the gently sloping ledge surface disappears beneath spongy marsh accumulations. The longer axis of the outcrop coincides with the strike and direction of latest glaciation, or S. S. W. This extent is seventy-two rods, and its greatest breadth is sixty rods. The highest points of its rounded crests are about forty feet above the marsh level. No talus nor glacial debris is found adjacent to this ledge, but the thin till covering that rests upon the rock surface, bears a vigorous forest growth. Its area is approximately twenty-five acres.

A half mile south of this island, domes of quartzite again appear along the crest of a ridge eighty feet above the marsh level. A succession of these ledges continues along the western slope and margin of this ridge for a mile, ending in a low dome of rock lying in the marsh on the north-east quarter of Section 33. These outcrops are all beautifully rounded and striated by glacial action, the coincidence of the strike of the beds with the direction of latest glaciation, greatly favoring the development of these symmetrical forms. The eastern margin of the ledge area is heavily overlaid by glacial drift. Along its marshy western border are several low mounds of much weathered talus and a wide boulder fringe, the quartzite blocks lying thickly together, and extending for nearly two miles on the lee slope of the ridge area.

On the gentle north slope of the ridge and lying between this ledge and Rocky island a very interesting paleozoic con

glomerate appears wherever the thin drift covering has been removed. It is first seen near the crest of the ridge and displays a very coarse boulder bed of rounded, wave-worn quartzite blocks of three or four square yards area lying closely together and imbedded in a matrix of finer quartzite and sand. As the formation is followed away from the ledges down the slope, the size of the quartzite blocks gradually decreases, until, on the bank of the river, a quarter mile distant from the out-crops, the conglomerate passes into a coarse friable sandstone. At certain points the imbedded quartzites present deeply exfoliating surfaces indicating extensive weathering.

This conglomerate appears at exposed points for half a mile along the north slope of this ridge and limited areas have been noted on the west side of the Portland area on Section 3, Waterloo township. No other exposures have been found in the district, though conglomerate bowlders have been seen in the drift in the vicinity of the Lake Mills outcrop.

Quarry ledge, the largest single outcrop of the range, lies just south of the last area in the southeast quarter of Section 33. The ledge rises abruptly on its east side, its slope corresponding to the dip of the strata and its highest point having an elevation of forty-five feet above the marsh level. From this marginal crest the surface slopes gently to the southwest until its border disappears beneath the marsh. A thin drift overlies the greater part of the ledge, but where this is removed the rock presents a gently undulating glacially planed surface. The strike and longer axis of this out-crop extends in a north-west-southeast direction from the center of the north line of the quarter section into Sections 3 and 4, Waterloo township. Its length is one hundred and eighty rods, and its greatest breadth is eighty rods; its area is about fifty acres.

A quarter mile east of this ledge is a high drift ridge that extends for two miles from the margin of the Crawfish on Section 27, Portland township, into Sec. 3, Waterloo township. On the slope facing the quarry ledge a shoulder of rock cuts through the drift for nearly a half mile and on the other side of the hill is a low ledge which covers an area of ten acres. On the descending crest of this ridge half a mile southwest of the last

ledge several low domes and flat planed surfaces of quartzite define the southern limit of the area. The length of the Portland area is two miles and its greatest breadth three-fourths of a mile.

The Hubbellton area is second in size and importance to the last. It lies parallel with this and they are separated by a ridge and marsh covered interval a mile and a half wide. Its northern exposure is a bare knob of rock projecting from the end of a drift ridge near the center of the northwest quarter of Section 36, Portland township. In a ravine on the west slope of this ridge the quartzite is again exposed for several rods. A quarter mile south on the center line of Section 36, is a low drift ridge from whose surface the quartzite protrudes at several points. On the western border of this ridge a bare ledge rises from the marsh level and extends for several hundred feet along the general trend of the area.

The remaining exposures are in Section 2, Waterloo township, being separated from the last by a half mile of marsh interval. The principal ledge outcrops form the north end of a drift ridge and extends in the direction of its strike for 300 feet along the east margin of its slope. The crest of the ledge rises about twenty feet above the marsh level and the breadth of the exposed surface is seventy feet. A second outcrop was lately discovered in a low, wooded swell an eighth of a mile southeast of the ledge just described. This consists of rounded edges of rock strata that just appear above the surface over an area of about an acre. In the marsh a quarter of a mile farther southeast is another tree-covered ridge with its crest almost completely covered with quartzite blocks, indicating the presence of a ledge at no great depth beneath. These exposures outline an area a mile and a half long and a half mile wide.

The single outcrop in the Lake Mills area was found by President Chamberlin* in tracing to its origin a well-marked bowl-der train that crosses the east half of Lake Mills township. The ledge has, therefore, received that name, although it lies on the east ledge of Waterloo township on Sections 24 and 25. It is four miles south of the Hubbellton area on the east mar-

* *Geology of Wisconsin*, Vol. II., p. 253.

gin of the ridge that borders the broad, marshy basin of the Crawfish river. Its linear extent is a quarter of a mile, and its breadth at center is thirty rods. As the rock also appears in a shallow well a quarter mile east of the ledge, it is probable that a considerable area of thinly covered quartzite lies between the exposed ledges and the high drift ridges to the west. The narrow ledge area of four or five acres evidently represents a glacially abraded surface of at least thirty acres.

The ledges forming the Mud Lake area were also located by tracing to their origin their trains of boulder drift. In Pres. Chamberlin's description of the area just referred to, mention was made of quartzite boulders at a considerable distance to the north and east of the ledges which were then known. From information obtained from residents of the region I was led to the largest of these ledges at the beginning of my work. This exposure is on the west side of an isolated ridge that lies in the marsh basin north of Mud Lake. Its length is eighty rods and its greatest breadth about sixty rods. The ledge surface on its margins rises abruptly from the marsh, but its highest points do not exceed twelve feet above the general level. The rock surface is also exposed in the bed of the creek that flows through the marsh west of the ledge and indicates an indefinite extension of the outcrop beneath the peat accumulations of the marsh basin. The presence of quartzite boulders in the glacial drift on the west side of this marsh and farther north than these exposures was observed at the time of the location of these ledges, but was first explained by supposing that concealed ledges exist in the marsh farther north than those already seen. But their frequent occurrence on the east side of this basin led to successful search for exposures on that side also. The eastern border of this boulder train was followed from the vicinity of Hubbellton northward across Shields township and the erratics were traced to their source in a small ledge on the east side of the marsh in the northeast corner of Section 2. This exposure consists of low swells of rock, the highest rising less than five feet above the marsh, and is included within an area of about four acres. The boulder train traced to this point stops at the ledge surface, only a single

quartzite pebble of the Waterloo type being found among the hundreds of cords of boulders observed on several square miles of surface which were explored north of this ledge. The position of this ledge at the northeast limit of the quartzite range gives it great prominence in the study of the boulder trains. The area over which these erratics have been found, forms a sector of eighty degrees divergence from this center and includes within its limits all of the other areas and boulder trains.

The location of several of these ledges by means of their boulder trains is instructive and suggests the question whether there are not still other quartzite outcrops within the area. Facts relating to the boulder distribution indicate that such is the case. Their presence in the marsh basin north of the Mud Lake exposures has already been suggested, and seems very probable. Evidence of a similar character exists in the interval between the Portland and Hubbellton areas. On the surface of a sharp drift ridge midway between these areas a large amount of fragmental quartzite is found which is distinguishable by its peculiarities of color and texture from any hitherto observed in the outcrops examined. It is apparently the product of abrasion from some near but concealed ledge surface. The existence of a ledge somewhere beneath the drift ridge itself has an increased probability from the observation in a well section on the south end of this ridge, of quartzite beneath eighteen feet of drift and thirty-six feet of red shade. The concealment of these supposed ledges by glacial drift and marsh accumulations renders their exact location a difficult matter.

Structural Features of the Exposures—Within the last few years extensive quarrying has been carried on at two of the ledges, which has very well exposed the bedding planes of the rock. On the broad fresh fracture surfaces thus developed this structure is almost as plainly seen as in unaltered sandstones so that not only the inclination of the layers but much of the conditions accompanying their original deposition is satisfactorily made out.

Conglomerate layers are of frequent occurrence in all of the marginal exposures of the Portland area. In the most southerly outcrops on Section 3, Waterloo township, the ledge is chiefly con-

glomerate, the rounded pebbles being almost entirely of quartz, principally of translucent white and gray, but with some red and brown opaque varieties as well. In drift boulders found in the lee of these ledges, pebbles of larger size from two inches in diameter downwards are seen. These are chiefly of light colored quartz but among them are a few of black magnetitic and gray micaceous schists. The abundance and condition of this included material indicates an approach at this margin of the area to the older formation. In the quarry ledge the discordant stratification observed on the face of the section plainly indicates beach action. This is also made evident by the rapid alternation over the same surfaces of finely granular and conglomeratic layers. On one of the ledges north of the quarry outcrop this structure is finely brought out. Crossing a smoothly planed surface of several square rods area are two layers of rather fine conglomerate, separated by a stratum of even-textured rock in which the layers of cross-stratification are as perfectly preserved as if the rock had undergone no metamorphism.

No conglomerates have been observed in the other areas. The finer material in these seems to have been very evenly deposited, but the bedding planes are plainly indicated on the ledge surfaces by narrow bands of slightly differing colors. The dip and strike are easily made out on nearly every ledge of the several areas.

In the northeast exposure of the Mud Lake area the strike is N. 80° E., or nearly east and west. The dip is here 45° to the south. In the larger western ledge the strike is more southerly or N. 55° E., with dip of 55° S. E. In the north ledge of the Portland area the strike of the parallel ledge crests is N. 30° E. with dip to the S. E. In the ledge next in order on section 28, a strike of N. 43° E. occurs, with dip of 42° to the S. E. On another surface on the northwest corner of section 34 the strike is N. 15° W., with dip of 71° E. In the last ledge of this series on the northeast quarter of section 33, a strike of N. 30° E. was again noted, with dip of 66° to the E. This variation of direction and inclination of strata continues in the exposed layers of the quarry ledge. On its north end the bedding planes at two points furnish a due north strike

with a dip of 60° to the E. On the south half of the ledge, strikes varying from 30° to 50° west of north were noted with dips from 30° to 40° to the N. E. In the ledges at the south end of the area on Section 3, Waterloo township, the observed strike is N. 34° W., and in the ledge on Section 34, of Portland township, a half-mile north, strikes varying from 33° to 40° west of north, and dips of from 30° to 40° N. E., were noted. In the Lake Mills area strikes of 45° and 60° west of north, with a dip of 40° to the N. E., were determined. In the medial Hubbellton area the strikes observed on the north ledges vary from due north to N. 20° W., with inclination of strata from 30° to 32° to the east. In the south ledges on section 2, Waterloo township, the strikes are from 15° to 20° east of north, with a dip of 20° to the east. The series of strikes occurring on the marginal areas closely correspond to the general outline of the range itself and roughly indicate the circumference of an ellipse on whose north side are the outcrops of the Mud Lake area and Island Ledge in the Portland area. The remaining ledges of the Portland area form the end of the ellipse, and the single Lake Mills ledge may be considered as indicating the beginning of the south side of the figure. The in-sloping strata in all of the out-crops suggest that these isolated areas may be the remnants of a broad, tolerably symmetrical trough, of steeply sloping sides and crumpled end. The Hubbellton area with its gentle dips is clearly near the center of this basin. The remoteness of the Lake Mills area, together with the rapid change of direction in the strikes of the strata exposed in the Portland area, suggest that this fold may be not a simple, but a somewhat complex synclinal with an injutting anticlinal between the end of the Portland area and the Lake Mills outcrop. This would account for the slight difference in strike of the layers in the Lake Mills ledge and in the ledges at the south end of the Portland area. The absence of outcrops between the two areas leaves the matter simply one of conjecture. The evidences of disturbance here described are of especial interest as explanatory of the metamorphism of the strata which will next be considered.

LITHOLOGICAL CHARACTERS OF THE QUARTZITES.

Prevailing Characters—The sharp folding of the strata indicated by the record of dips and strikes, is accompanied by evidences of extreme metamorphism. This is apparent in the ledge surfaces in the abundance of seams and cracks, and in the ease with which all angular surfaces are chipped under the hammer. Its effects are also shown on close examination of the rock texture. As compared with the usual quartzite rock from the Lake Superior Huronian it shows a much less distinctly granular appearance. Outlines of individual crystals are very indistinct and in the coarser textured rock ill-defined mottlings take their place.

The usual fresh aspect of quartzite exposures characterizes both the ledge surfaces and in general the material forming the boulder trains. But in the considerable talus accumulations which lie on the margin of the Portland area many of the blocks are deeply exfoliated and similar evidences of atmospheric action occur in some of the imbedded blocks of the Paleozoic conglomerate that borders the same area. These effects are apparently due to the much greater time that these surfaces have been exposed than the glacially abraded ledges.

The minerals recognized in these quartzites are few in number, namely quartz with its inclusions of small crystals of zircon and magnetite, and fluid cavities, sericite and iron oxides. Variations in the size of quartz grains and their granulation from shearing, and in the amount of sericite present, have produced a somewhat wide range in the appearance of the material from the different parts of the field. The grouping of outcrops into isolated areas has given us, however, a basis for the classification of these naturally blending forms, which will be followed in the descriptions of the principal types.

The Portland Type—The outcrops comprising this area afford the widest range in microscopic appearance. The rock is commonly a coarsely crystalline quartzite with a somewhat mottled surface and splintery fracture. The secondary material is chiefly sericite and is relatively large in amount, often in suf-

ficient abundance to give a slightly schistose appearance to fractured surfaces. Variations in structure appear in the chief exposures, gradations occurring in the different layers from finely granular structure to conglomerates containing pebbles two inches in diameter. Its range in color is from light gray to drab in some of the finer textured layers, and to a blue or purplish cast in the ledges farthest east.

Less variation is seen in its composition on microscopic examination. Quartz appears in fragments of irregular form and varying size, from one millimeter downward to the limit of determination. The most common arrangement of the larger grains is in clusters which give rise apparently to the mottled appearance of the surface. The separate grains in these clusters often show extinction at nearly the same angle, and this with the close interlocking of such forms indicates that these groups are the fragments *in situ* of large individual crystals. Quartz and iron oxide, apparently magnetite, are mingled with the interstitial sericite which usually appears in flakes between the quartz areas. The usual inclusions in quartz are present, and in some sections indications of the alteration of the iron oxide to the hydrated form are noticeable. This type of structure is shown in Plate VIII, Fig. 1 and Plate IX, Fig. 1. In the distinctively conglomeratic layers the pebbles contain very little interstitial quartz material, but the matrix is in large part composed of inwrapping plates of sericite.

The Hubbellton Type—Quartzites exposed in the ledges of this area have a quite different aspect and structure from the Portland quartzites. They are homogeneous in texture, of blue and purplish tones, translucent and exceedingly brittle. Bedding planes are indicated on the cross fracture by narrow bands of varying color and translucency. The outcrops at the north end of the area show dark bluish, somewhat banded layers, while those on Sec. 2, Waterloo township, are of a very brittle translucent rock of reddish purple color. The microscopic structure is similar in all the sections examined from these ledges. The larger quartz grains are commonly of elongated forms and exhibit a parallelism in arrangement. Their outlines are exceedingly irregular and they are usually bordered by

smaller quartz grains. Sericite forms but a small part of the interstitial material, being confined to isolated knots and streaks. The finely granulated quartz is abundant about the larger grains and stainings of ferrite are seen chiefly in association with the sericite. Undulatory extinction is common in the larger quartz sections (Plate VIII, Fig. 3). The layers in the Lake Mills outcrop belong to the Hubbellton type and exhibit unimportant modifications. The prevailing color is a darker blue and the banding in some layers is more distinct. In other layers an increase of iron oxide produces an opaque black rock. Quartz individuals appear in the section to be of somewhat larger size with less amount of fine interstitial material. Iron oxide is present in larger quantity but sericite bears about the same proportion to the other minerals as in the Hubbellton sections (Plate VIII, Fig. 4). The black layers appear to be composed of very finely pulverized quartz, cemented by an opaque matrix in which magnetite composes a considerable proportion of the whole.

The Red Quartzite.—This type has already been noted as present in considerable quantity on the surface of a drift ridge midway between the Portland and the Hubbellton areas. It is a fine textured rock of pinkish gray color, of low translucence and presents on fractured surfaces a granular or saccharoidal aspect. Quartz individuals as seen in section are very small, usually not exceeding one-fifth of a millimeter in diameter. They are distributed quite uniformly through the section, and are enveloped in a comparatively large amount of sericite-bearing interstitial material. In one of the sections examined clusters of larger grains occur, in which the correspondence of outline and slight orientation of axes indicate that they are simply the slightly displaced fragments of single crushed individuals. (Plate VIII, Fig. 2; Plate IX, Fig. 2.) This rock resembles in composition and structure the Portland type, but in general appearance is very similar to the rocks of the Hubbleton area. Its interest aside from its unknown derivation consists in its well defined red color and the consequent ease with which its boulder distribution has been made out. Errat-

ics identical in appearance with these have been found in each of the distinctive areas covered by the boulder fans.

The Mud Lake Type—The quartzites here exposed have a general resemblance to the rock from the Portland area, but are more vitreous and translucent, the quartz appearing in larger crystals with indistinct outlines and with smaller amounts of interstitial material. Minute facets of mica and streaks of reddish opaque iron oxide appear on fractured surfaces. The coarser varieties range in color from light gray through pink and blue tones to dark red and purple, with little apparent difference in structure. All of these variations in color appear in the layers exposed within an area of a few square rods on the surface of the small east ledge. The larger west ledge presents a finer textured rock of more uniform color, which approaches in general aspect the layers exposed in the Lake Mills ledge.

The structure shown in thin sections is distinctive. Quartz individuals are of a larger size than any found elsewhere in the series, often appearing of several square millimeters area. Their outlines are very irregular, the individuals closely interlock and comparatively little finely granulated material is present. The larger grains show evidence of much disturbance, fine irregular cracks traversing the section in all directions (Plate VIII, Fig. 5.). Sericite inclusions are abundant in sections from the micaceous layers. In the same sections, however, lines of fluid inclusions lying in roughly parallel directions divide the larger areas into linear fragments and indicate the position of the fracture planes developed by the shearing process. The sericite films are found for the most part along these lines of inclusions and their association indicates that the secondary mineral was formed at the time of the crushing of the crystals, and that the amount of internal movement was not sufficient to greatly displace the fragments (Plate VIII, Fig. 6.). Besides these secondary inclusions small crystals of magnetite are of frequent occurrence. Microscopically also the finer grained quartzite from the west ledge resembles that which occupies the Lake Mills area.

The arrangement of these fluid inclusions is very similar to those described by Dr. Van Hise from the quartzites of the

Black Hills,* and they are there considered as due to the opening of the grains along these lines by the crushing force and the attendant redeposition of quartz imprisoning within them the inclusions.

The Metamorphic Conglomerate.—Some light is thrown upon the origin of the formation by an examination of the pebbles from the conglomeratic layers. These are chiefly of very pure glassy quartz from white to reddish purple or nearly black, but among these are gray micaceous and black magnetite fragments. Sections from the latter show that quartz is still the principal mineral, with large amounts of mica and iron oxides in the interstitial material. Hematite occurs with the magnetite in these sections, the former being distinguished by its blood red translucency. The matrix inwrapping these pebbles contains a relatively large amount of sericite and gives a more decided schistose aspect to the conglomerate than is observed in the more homogeneous layers. The presence of these conglomerates on the northwest margin of the area may indicate the near approach of the strata to the contact zone bordering the older formation.

COMPARISON WITH LAKE SUPERIOR AND OTHER QUARTZITES.

The evidence of dynamic action accompanying the metamorphism of these rocks is strikingly at variance with the more common structure of the pre-Cambrian quartzites of the region of the Great Lakes and upper Mississippi as described by Dr. Van Hise.† He says:

“About one hundred localities, the most of them of pre-Cambrian age, are mentioned in bulletin No. 8 of the U. S. Geological Survey, in which the induration of quartzites was produced by a process of enlargement of old quartz particles or else by the deposition of new quartz between the grains rather than a destruction of the original fragments. So far as our experience has extended, practically all quartzites properly so-called of whatever age, thus reveal their fragmental

* Bulletin of the Geological Society of America, Vol. I, p. 215, et seq.

† Ibid., p. 213.

character, except when they have been subjected to great dynamic action. * * * The great mass of the Devil's Lake quartzite of Central Wisconsin exhibits perfectly, under the microscope, its fragmental character, but along certain narrow zones slipping action has taken place; the grains have been elongated in a common direction, and it is hard to find the clastic cores if any exist."

Later observations upon the Huronian quartzites made by Dr. Van Hise indicate that instances of dynamic metamorphism are not altogether uncommon among them. These, however, occur in comparatively narrow areas and where structures similar to these found in the Waterloo area are noticed. Differences in the composition of the rock are generally sufficient to distinguish them.

A beautiful instance of the extent to which the deformation of quartz can be carried by pressure has been described by Futterer.* In his description of the quartz porphyries of Thal in the Thuringian Forest, he mentions the apparent stretching and bending of quartz grains into forms of several times their original length. He notes the disturbance in the molecular arrangement which appears in the optical behavior of the mineral, a bisectrix emerging in some sections as in the case of biaxial minerals.

SUMMARY.

The quartzites here described occur in a broad basin deeply eroded into the Lower Silurian strata in southern Wisconsin, and are grouped into four areas separated by considerable intervals of surface underlaid by sedimentary rock. From the correlation of observations upon the strike and inclination of the strata, a synclinal fold is indicated having an east-west axis; the fold appears to have an easterly pitch and comes to the surface in the vicinity of the Portland outcrop. The direction of dip in the Mud Lake and Lake Mills areas would seem to outline the position of the synclinal. Dips as high as sixty degrees occur in the Portland area, and the rapid variation both in strike and dip even within a single ex-

*Die Ganggranite von Grosssachsen und die Quartzporphyre von Thal im Thuringer Wald. Inaug. Diss. Heidelberg, 1890.

posure, are evidences of strong orographic movements in the area.

The rock is throughout a quartzite becoming conglomeratic in portions of the Portland area. Magnetite and zircon occur sparingly as primary inclusions, while sericite is a somewhat important secondary development in some types.

The microscopic examination of the sections reveals much deformation of the quartz. The ditrital character of the rock has been nearly obliterated by the crushing and recementing of the quartz grains. Sericite has been developed through this means. Differences in composition and degree of metamorphism have produced four tolerably distinct types of quartzite, the recognition of which in the fragments composing the boulder trains is of great assistance in defining their distribution. These correspond with the isolated areas of outcrops and are described under the names Portland Type, Hubbellton Type, Red Quartzite and Mud Lake Type. Microscopically the distinctions lie in the relative coarseness of texture, the amount of granulation of quartz, the relative development of secondary sericite and the way in which the larger quartz fragments join one another—whether by locking together without interstitial material like the sutures of a skull, or cemented by a larger or smaller amount of finely granulated quartz and sericite. While the differences in these respects are not always great, they nevertheless suffice in most cases for the identification of a specimen with some one of the exposure areas. Corresponding with the microscopic differences, are variations in the aspect of the rock which seem slight at first and are difficult to describe, but which from long familiarity come to have distinguishing value.

From a comparison of structural features found in these rocks with Huronian quartzites from the areas of their occurrence to the north and northeast of this region the deduction is reached that the former present distinctive features of sufficient value to lead to their recognition.

Familiarity with these differences is of great assistance as affording criteria for separation of the quartzite drift from the Waterloo area, from boulder material from any of these other

sources, and enabling a more exact delineation to be made of boulder trains that extend outwards from these ledge areas upon and within the different glacial formations of the Rock river valley.

It is but just to state in conclusion that the petrographic investigations here outlined have taken the writer into a field new to his experience and that acknowledgements are due to Dr. W. H. Hobbs, of the University of Wisconsin, under whose instruction this work has been carried on, and whose suggestions have been of invaluable assistance in this presentation of results.

EXPLANATION OF PLATES.

PLATE VII.

Map of the area including the Waterloo quartzite outcrops. Scale 1:99,566. Contour Interval 20 ft. The dark areas are quartzite exposures.

PLATE VIII.

Fig. 1. Section of Portland quartzite. In the upper left hand portion of the section is a cluster of quartz grains. Sericite and magnetite with finely granular quartz form the greater part of the interstitial material. x25.

Fig. 2. Section of red quartzite. The quartz is in clusters of small grains with some more finely comminuted grains as interstitial matter, but the larger part of the interstitial material is sericite in elongated irregular forms. x25.

Fig. 3. Section of Hubbellton quartzite. The larger quartz grains are in elongated forms with general parallelism in axial directions. They are often fractured and generally show undulatory extinction and peripheral granulation. The interstitial material is chiefly finely granular quartz. Sericite occurs in scattered areas with occasional grains of magnetite and zircon. x25.

Fig. 4. Section of Lake Mills quartzite. The minerals and their arrangement are the same as in Fig. 3, but the quartz

grains are larger, less elongated, and have a smaller amount of finely comminuted quartz as interstitial material, indicating that it has been subjected to less disturbance than the last. x25.

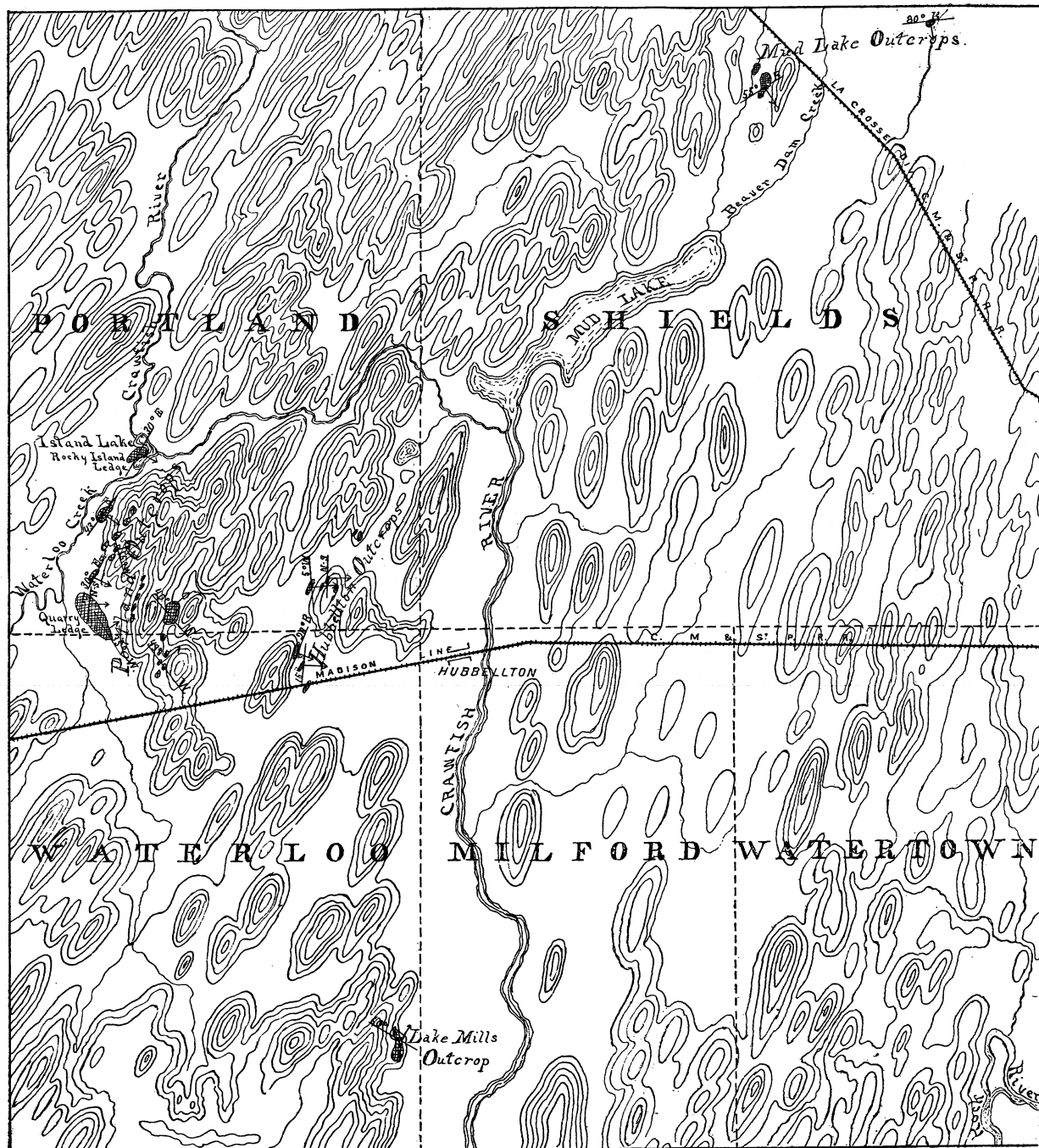
Fig. 5. Section of Mud Lake quartzite. The large quartz grains are elongated and have wavy extinction, interlocking with one another without interstitial material, the axial direction of the interlocking areas being essentially parallel. Sericite occurs in small scattered areas. x25.

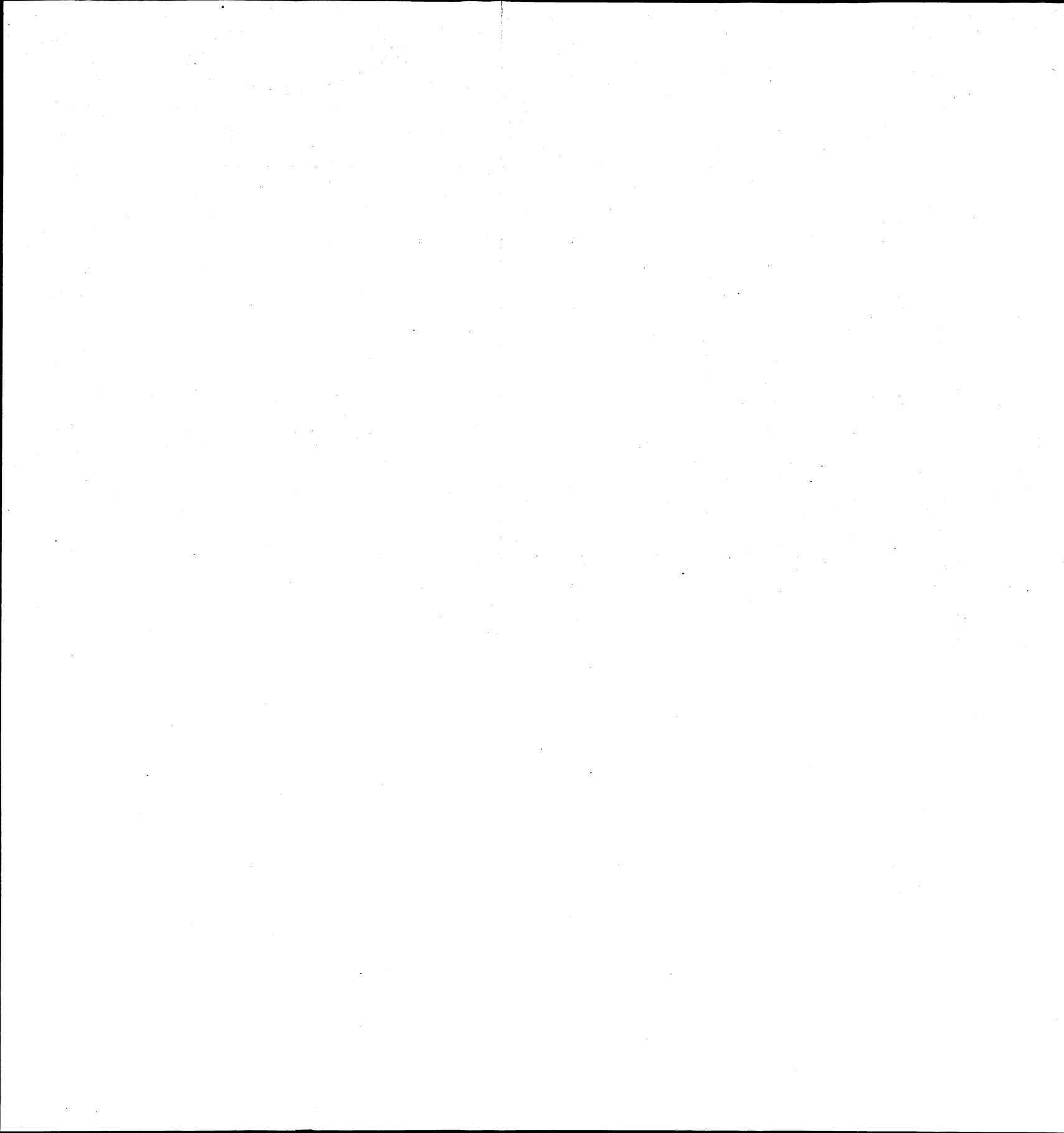
Fig. 6. Section of Mud Lake quartzite. Sericite and liquid inclusions in a single quartz individual. The sericite frequently shows hexagonal outlines and is arranged along the fracture lines like the liquid inclusions. The latter divide the surface into irregular areas. x25.

PLATE IX.

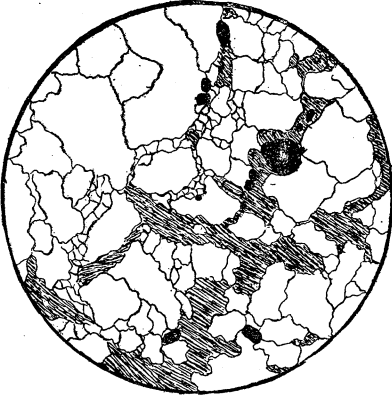
Fig. 1. Section of Portland quartzite. The quartz is in clusters of angular interlocking grains. The interstitial material is chiefly sericite. Crossed nicols. x40.

Fig. 2. Sections of red quartzite. The quartz grains are more evenly distributed than in the last, are of smaller dimensions, and are accompanied by a larger proportion of sericitic interstitial material. Crossed nicols. x40.

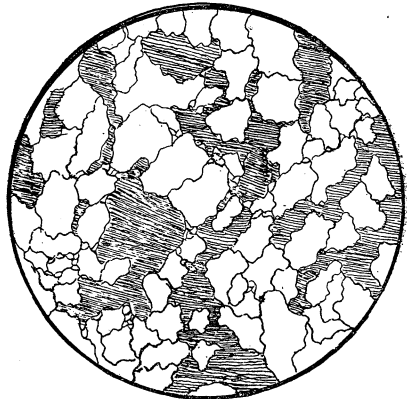




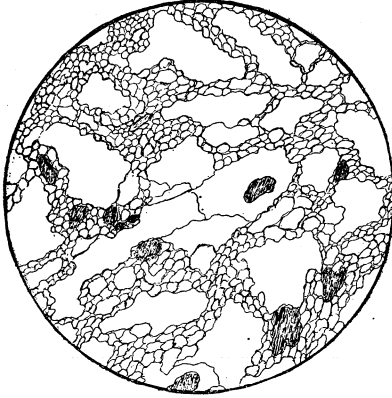
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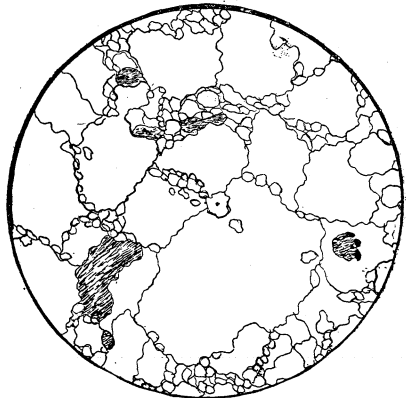
2.



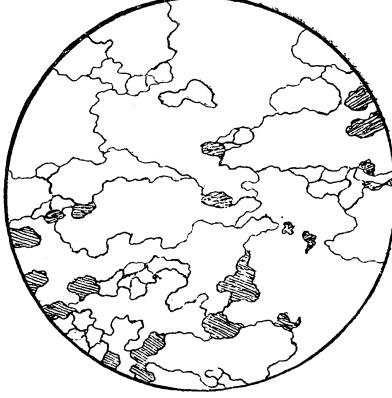
3.



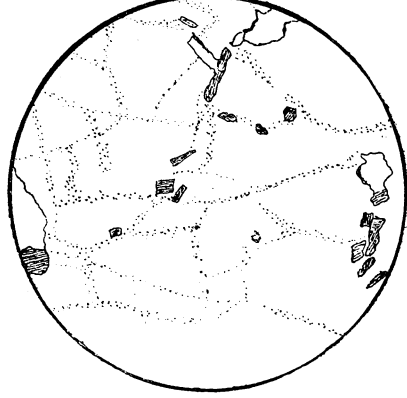
4.



5.

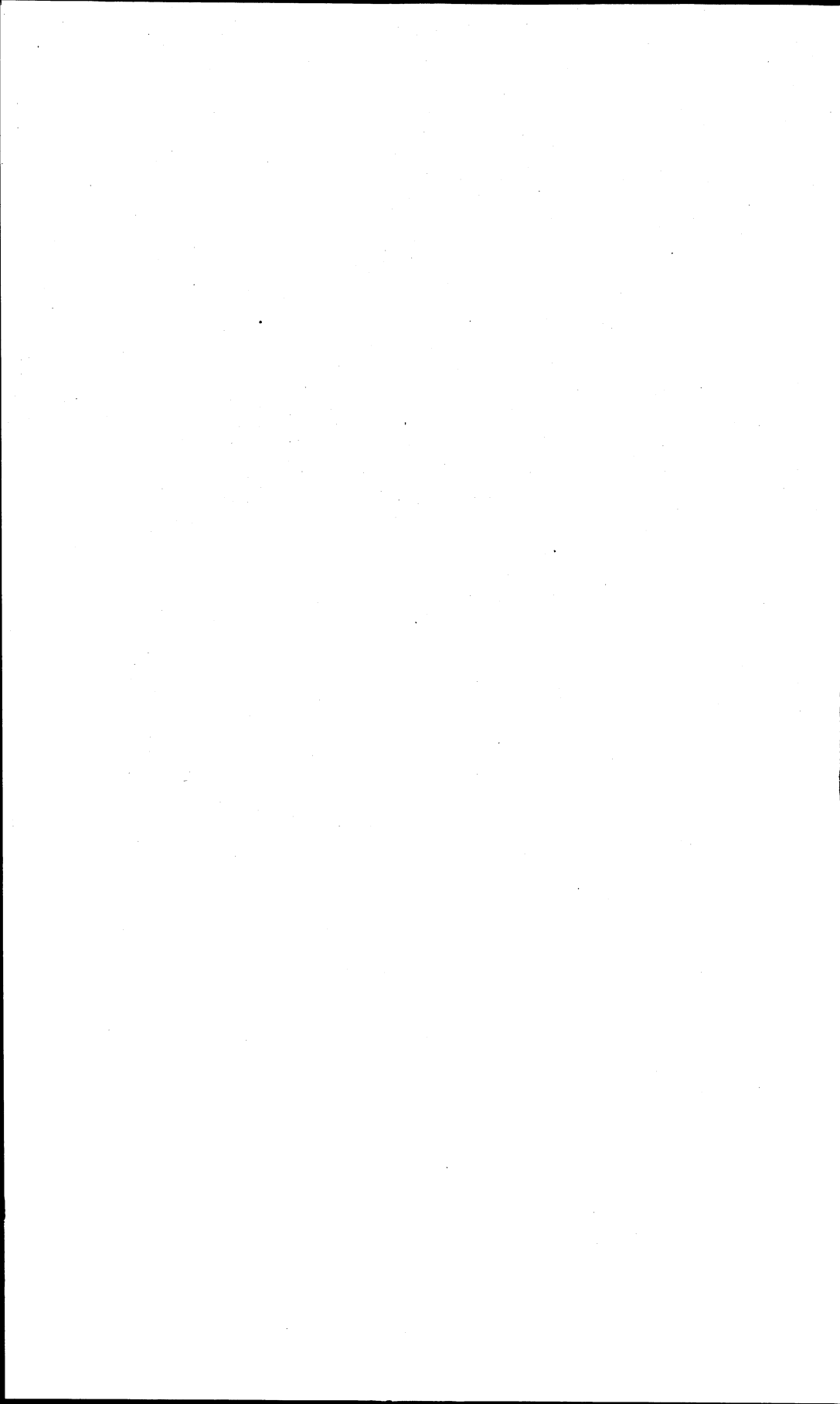


6.



Buell.

Waterloo Quartzite Area.



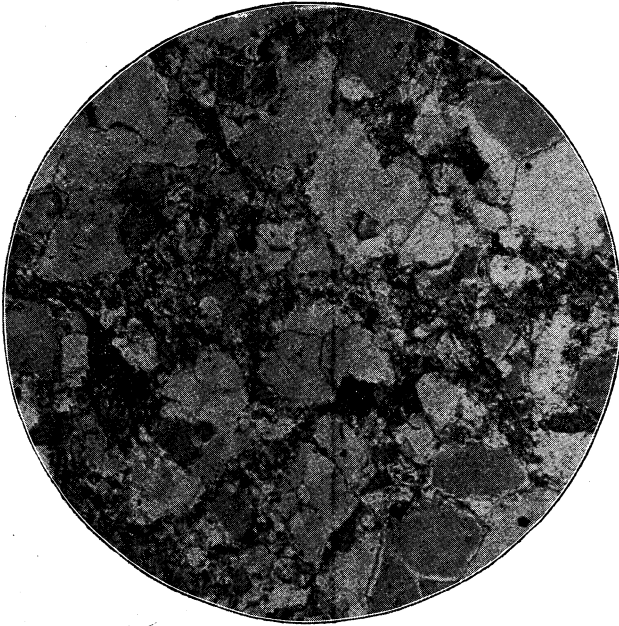


FIG. 1.

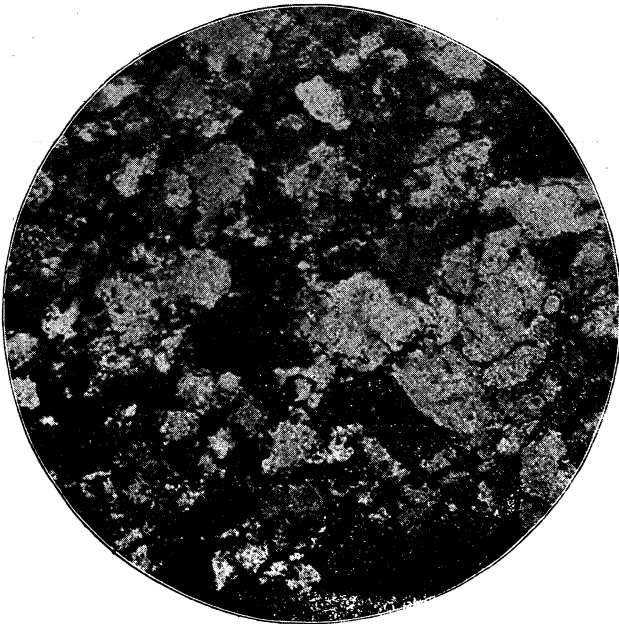
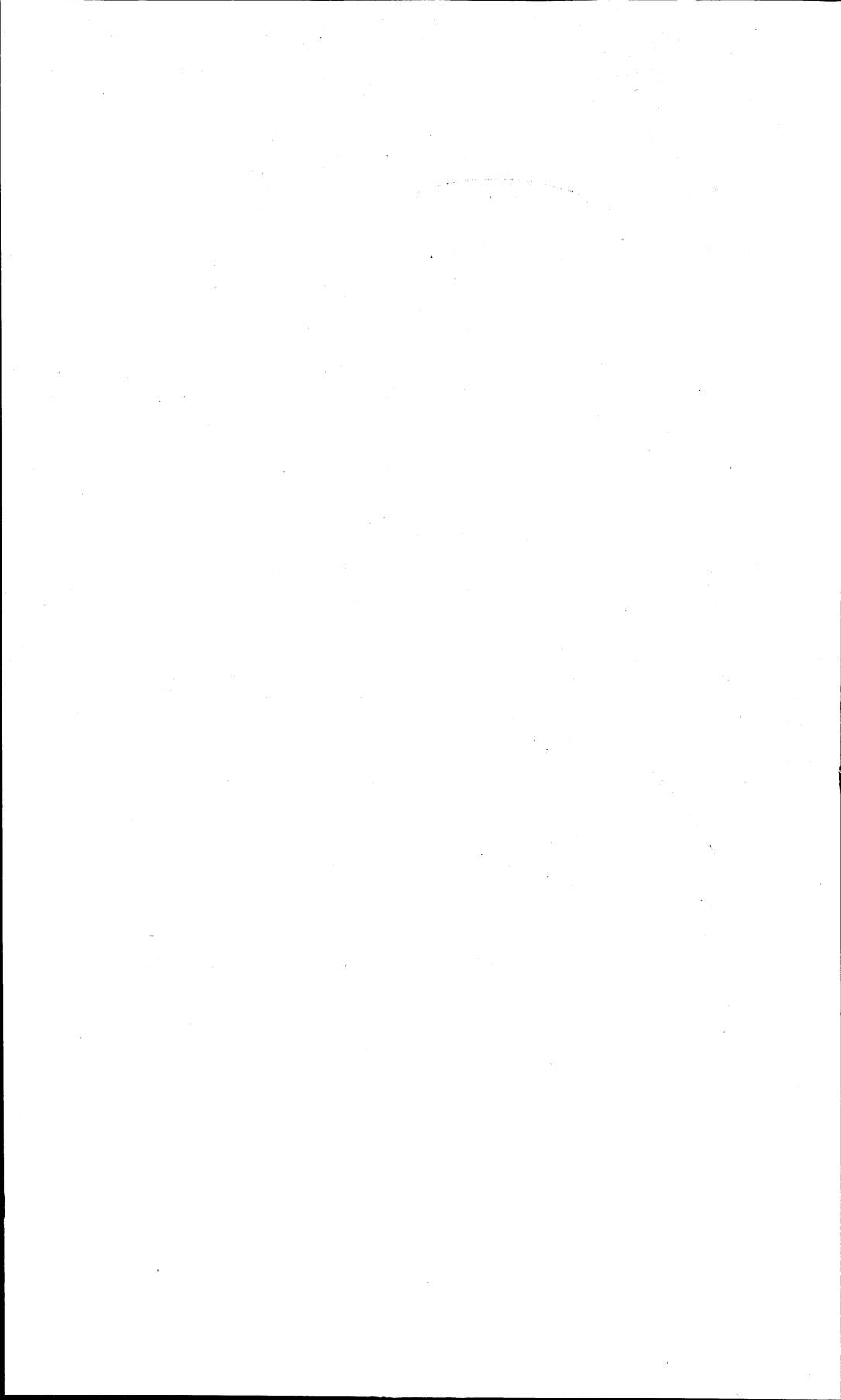


FIG. 2.

Buell.

Waterloo Quartzite Area.



NOTES ON CLADOCERA. III.*

By E. A. BIRGE, Professor of Zoology, University of Wisconsin.

A. *On a Collection of Cladocera from Central and Northern Wisconsin and Northern Michigan.*

In the summer of 1892, I made a short collecting trip through central and northern Wisconsin, occupying the last days of July and the first of August. Earlier in the same season I visited Green lake and made collections supplementing the pelagic material kindly given me by Prof. C. Dwight Marsh, of Ripon College, Wis. In August, 1893, I collected Cladocera in Washington Harbor, Isle Royale, Michigan, and in Gogebic lake, Mich. During the same season Mr. L. S. Cheney, of the University of Wisconsin, collected for me in northern Wisconsin, but his material, except that from lake Vieux Desert, has not yet been thoroughly studied.

My thanks are due to Hon. Philo Dunning, the former president of the Wisconsin Fish Commission, and to Gen. E. E. Bryant, its present head, for securing me free transportation on these excursions; and to the officials of the Chicago, Milwaukee & St. Paul Railroad, and of the Milwaukee, Lake Shore & Western Railroad for transportation furnished.

The central Wisconsin collections were made from lakes Winnebago, Butte des Morts and Green, and also from ponds and marshes at Necedah and New Lisbon. Pelagic material has also been given me by Prof. Marsh from lakes Puckaway, Buffalo and Rush, but this, so far as examined, has shown little of interest.

In northern Wisconsin I visited Rhineland, collecting in

*The preceding articles of this series were published in the Transactions of this Academy, vol. IV, 1878, and vol. VIII, 1891.

lake Julia and in marshes; lakes Tomahawk and Kawaquesaga in Oneida county, Pioneer and Twin lakes in Forest county, and Ashland and Bayfield harbors on Lake Superior. Mr. Cheney collected in lake Vieux Desert on the line between Michigan and Wisconsin, and I have visited lake Gogebic in Michigan and have received material collected at Watersmeet by Prof. C. R. Barnes.

Collections were also made at numerous other points in northern Wisconsin, among them Goodnow, Harshaw, Hixon and Tomahawk on the Valley Division of the C. M. & St. P. R. R., Lac du Flambeau, Woodruff and Bolton on the M. L. S. & W. R. R., but they did not show any species not included in the lists from the lakes where more careful work was done.

The lakes in which I collected differ considerably in character. Lake Winnebago is a large sheet of water, about thirty miles long by fourteen in width. It is very shallow—nowhere over twenty to twenty-five feet deep. At the place where my collection was made—about eight miles north of Oshkosh—the lake yielded a great amount of pelagic material and but little from the shore waters. *Anchistropus minor* is the only rare species found here. Lake Butte des Morts was visited only at the end nearest Oshkosh. The collection from this lake as well as that from lake Winnebago can not represent their fauna at all adequately.

Green lake near Ripon has been thoroughly studied by Prof. C. Dwight Marsh so far as its pelagic Copepoda are concerned. Its physical characters are described by him in a paper published in the Transactions of this Academy, vol. VIII, p. 214. The lake is over 200 feet in depth. It afforded very few peculiar forms. *Pleuroxus nanus* was found here and this is the furthest point to the south at which it has been found. If further study shows this species to have a wider southern range, the Cladoceran fauna of the lake will not differ from that of the shallower lakes in the same region.

Collections were made at Necedah and New Lisbon from streams, ponds and marshes. *Latonopsis australis* was found at the former place, the only locality where it has been found outside of Madison.

The most important collection of the excursion was made at Minocqua in lake Kawaquesaga. This is a very irregular sheet of water, whose numerous shallow bays are filled with an abundant growth of *Utricularia* and other water plants. Its depth is not over thirty feet in any place which I visited. Thirty-nine species of Cladocera were found here, the most remarkable being the new species, *Bunops scutifrons* and *Chydorus faviformis*. Here, too, *Acantholeberis curvirostris* and *Streblocerus serricaudatus* were found for the first time.

The other lakes examined in northern Wisconsin were Julia, Tomahawk, Twin, and Pioneer. They are much alike in character. They are twenty to thirty feet deep, rather regular in outline, at least in the parts visited. The bottom is sandy, the shore abrupt with little marsh and few water plants. Rushes grow in the shallower parts but usually spring from the sand, so that the conditions are not the best for a large variety of Cladocera. *Holopedium gibberum* was found in only one of these lakes, lake Julia at Rhinelander. *Leptodora hyalina* did not occur at all, although it was looked for. The species has however been found in the same region at Watersmeet, Mich., so that no conclusion as to its distribution can be drawn from its absence in these cases.

Gogebic lake, Michigan, is a large lake about fourteen miles long and two to three in width. It is shallow, being only about twenty-two feet deep at the southern end which was the part I visited. Into this end the Slate river flows and there is an abundant growth of weed. There are many littoral species, and as the lake is so long and so much exposed to the wind, the pelagic species are mingled with the littoral fauna. Here was found a remarkable variety of *D. hyalina*, whose crest resembles greatly that of *D. intexta*, Forbes. In this lake were found the rare forms, *Anchistropus minor*, Birge, *Chydorus rugulosus*, Forbes, *Chydorus faviformis*, Birge.

Pelagic collections were made at Ashland and Bayfield, Wis. Nothing of especial interest was found except *Holopedium gibberum* at Bayfield and a single specimen of *Macrothrix rosea* at the same place.

Washington Harbor, Isle Royale, was carefully examined. There was a very scanty pelagic fauna. This was true of all places where I dredged on the north shore of Lake Superior. In the shallows at the head of the harbor were found *Drepanothrix dentata* in large numbers (not previously found except at Madison), *Alona fulcata*, *Chydorus rugulosus*, *Pleuroxus nanus*.

In the following table *l* denotes that the species was found in the littoral waters; *p*, that it is pelagic; *m*, that it was found in marshy waters.

Table showing the species of Cladocera collected in central Wisconsin and northern Wisconsin and Michigan.

	Butte des Morris.	Winnebago.	Green.	Necedah.	New Lisbon.	Julia.	Rhinelandter.	Tomahawk.	Mitocqua.	Twin.	Pioneer.	Ashland. Bayfield.	Isle Royale.	Vieux Desert	Gogebic.
HOLOPEDIIDÆ.															
<i>Holopedium gibberum</i> , Zad.						p						p			
SIDIDÆ.															
<i>Sida crystallina</i> , O. F. M.	l	l	lp	l	p	lp	m	lp	p	lp	l				l
<i>Daphnella brachyura</i> , Liev.	l	lp				lp		l	lp	lp		p			pl
<i>Daphnella Brandtiana</i> , Fisch.			l	l	m	p	m		lp		l				l
<i>Latona setifera</i> , O. F. M.	l							p	l					l	lp
<i>Latonopsis occidentalis</i> , Birge.				m											
DAPHNIDÆ.															
<i>Simocephalus vetulus</i> , O. F. M.	l	m	m	m	m	p	m	m	l	m		m			
<i>Simocephalus serrulatus</i> , Koch.	l		l	l	m		m	m	l						l
<i>Simocephalus exspinosus</i> , Koch.			m							l	i	m			
<i>Ceriodaphnia reticulata</i> , Jur.			l	m	m				l						
<i>Ceriodaphnia pulchella</i> , Sars.	l	l			m				l	l					
<i>Ceriodaphnia consors</i> , Birge.			l	l					l						

	Butte des Morts.	Winnebago.	Green.	Necedah.	New Lisbon.	Julia.	Rhineland.	Tomahawk.	Minocqua.	Twin.	Pioneer.	Ashland Bayfield.	Isle Royale.	Vieux Desert	Gogebic.
DAPHNIDÆ — Continue.															
<i>Ceriodaphnia quadrangula</i> , Sars.....								1			1				1
<i>Ceriodaphnia lacustris</i> , sp. nov	1	lp				p			p	1	1				1
<i>Scapholeberis auratta</i> , Fisch.....			lm	m											
<i>Scapholeberis mucronata</i> , O. F. M.....	1	m	m	m	m	1	p	1	m	1			1		
<i>Daphnia pulex</i> , var. <i>pulcaria</i> , Forbes					m										
<i>Daphnia Schoedleri</i> , Sars.....						p								p	
<i>Daphnia hyalina</i> , Leydig.....		p	p			p		p	p	pl		p	p		lp
<i>Daphnia Kahlbergiensis</i> , var. <i>retrocurva</i> and <i>in texta</i> , Forbes	p	p	p			p	p	p	p		1	p			lp
<i>Daphnia Kahlbergiensis</i> , var. <i>breviceps</i> , var. nov								p		p					
MACROTHRICIDÆ.															
<i>Lathonura rectirostris</i> , O. F. M.....					m				1		1				
<i>Macrothrix rosea</i> , Jur.....				m	m										
<i>Macrothrix laticornis</i> , Jur.....						p						p			
<i>Drepanothrix dentata</i> , Eurén.....													1		
<i>Ophryoxus gracilis</i> , Sars.....				m		1		p	1						1
<i>Bunops scutifrons</i> , sp. nov									1						
<i>Streblocerus serricaudatus</i> , Fischer.....							m		1						
<i>Acantholeberis curvirostris</i> , O. F. M.....							m		m						
<i>Ilyocryptus longirostris</i> , Sars.....							m		1				1		1
BOSMINIDÆ.															
<i>Bosmina longirostris</i> , O. F. M.....	1	lp	1	1	m	1		p	1		1		1		1
<i>Bosmina cornuta</i> , Jur.....									1						
<i>Bosmina</i> , sp?.....	p	p	p			p		p	p	p	p	p	p	p	lp
LYNCEIDÆ.															
<i>Eurycercus lamellatus</i> , O. F. M.....	1	m	m	m		1		p	1	m			1		

	Butte des Morts.	Winnabago.	Green.	Necedah.	New Lisbon.	Julia.	Rhinelande- r.	Tomahawk.	Minocqua.	Twin.	Pioneer.	Ashland. Bayfield.	Isle Royale.	Vieux Desert.	Gogebic.
LYNCEIDÆ—Continued.															
<i>Alona quadrangularis</i> , O. F. M.	1														
<i>Alona affinis</i> , Leydig				m	m	l	m		l		l		l		l
<i>Alona lineata</i> , Fischer			m			l	m	p	l	l					
<i>Alona guttata</i> , Sars		l			m		m		l	l			l		
<i>Alona costata</i> , Sars	l	l	m	m	m	l	m	m	l	m					
<i>Alona lepida</i> , Birge								p					l		l
<i>Alona falcata</i> , Sars													l		l
<i>Alonella rostrata</i> , Koch									l						l
<i>Monospilus tenuirostris</i> , Fischer						l		p		m			l		l
<i>Graptoleberis testudinaria</i> , Fischer			l	m		l		lp		m	l				l
<i>Dunhevedia setiger</i> , Birge			l												
<i>Pleuroxus denticulatus</i> , Birge	l	m	m	m	m	p	m	p	l		l				l
<i>Pleuroxus gracilis</i> , Huden- dorff, var. <i>unidens</i> , Birge			l	m				m			l				l
<i>Pleuroxus exiguus</i> , Lillj				m	m					m					
<i>Pleuroxus excisus</i> , Fischer							m	m							
<i>Pleuroxus procurvatus</i> , Birge	l	m	l	m				mp	l	m	l	m			l
<i>Pleuroxus nanus</i> , Baird			l						l				l		
<i>Pleuroxus hastatus</i> , Sars				m	m							p			l
<i>Anchistropus minor</i> , sp. nov.		l													l
<i>Chydorus rugulosus</i> , Forbes													l		l
<i>Chydorus faviformis</i> , sp. nov.						l			l	m					l
<i>Chydorus sphaericus</i> , O. F. M.	l	lp	m	m	m	l	m	m	lp	lp	l	m	l		l
<i>Chydorus globosus</i> , Baird	l	l						lp	l						l
<i>Alonopsis latissima</i> , Kurz			m						l			m			
<i>Acroperus leucocephalus</i> , Koch			m	m	m			m	mp	m	l		l		l
<i>Acroperus angustatus</i> , Sars	l		m	m		l			l			m	l		l

	Butte des Morts.	Winnebago.	Green.	Necedah.	New Lisbon.	Julia.	Rhineland.	Tomahawk.	Minocqua.	Twin.	Pioneer.	Ashland.	Isle Royale.	Vieux Desert.	Gogebic.
LYNCEIDÆ—Continued.															
<i>Camptocercus rectirostris</i> , Schdl.....	1	1						p	1		1				1
POLYPHEMIDÆ—															
<i>Polyphemus pediculus</i> , De Geer.....	1			1	m		m		1			p			
LEPTODORIDÆ—															
<i>Leptodora hyalina</i> , Lillj.....	pl	p	p									p			

The total number of species and varieties in the foregoing list is sixty-three, distributed as follows:

Holopediidae	1
Sididae	5
Daphniidae.....	16
Macrothricidae.....	9
Bosminidae.....	2*
Lynceidae.....	28
Polyphemidae.....	1
Leptodoridae.....	1

It is not impossible that the forms described as *Daphnia Schoedleri*, Sars, and *D. pulex*, var. *pulicaria*, Forbes, are really the same. More than two varieties of *D. Kahlbergiensis*, Schdl., might have been enumerated, and almost every lake has its own variety of *D. hyalina*, Leyd. Among the Lynceidae the several varieties of *Chydorus sphaericus* were noted but their distribution was not determined. These were the forms, *C. caelatus*, Schdl.; *punctatus*, Hellich; *nitidus*, Schdl., and *minor*,

* Besides several unidentified forms.

Lillj. *Daphnia minnehaha*, Herrick, and *Pleuroxus trigonellus*, O. F. M., were also found at Tomahawk, Wis. There have, therefore, been collected from central and northern Wisconsin a total of sixty-nine species and varieties, which in most European lists rank as species.

The following species in the list are new to science:

Ceriodaphnia lacustris, sp. nov.

Daphnia Kahlbergiensis Schdl. var. *breviceps*, var. nov.

Bunops scutifrons, gen. et sp. nov.

Anchistropus minor, sp. nov.

Chydorus faviformis, sp. nov.

The following species are new to the United States:

Simocephalus exspinosus, Koch.

Ceriodaphnia quadrangula, Sars.

Streblocerus serricaudatus, Fisch.

Acantholeberis curvirostris, O. F. M.

Alona falcata, Sars.

Alonella rostrata, Koch.

Pleuroxus hastatus, Sars.

Acroperus angustatus, Sars.

The following species are new to Wisconsin:

Daphnia pulex, var. *pulicaria*, Forbes.

Monospilus tenuirostris, Fisch.

Pleuroxus nanus, Baird.

Chydorus rugulosus, Forbes.

The following species and varieties have not as yet been found in southern Wisconsin, although no doubt many of them will be discovered there:

Daphnia Kahlbergiensis, var. *breviceps*, Birge.

Acantholeberis curvirostris, O. F. M.

Alona falcata, Sars.

Alonella rostrata, Sars.

Monospilus tenuirostris, Fisch.

Pleuroxus nanus, Baird.

Pleuroxus hastatus, Sars.

Chydorus rugulosus, Forbes.

Chydorus faviformis, Birge.

Several species were not found north of central Wisconsin:

Scapholeberis aurita, Fisch.

Pleuroxus exiguus, Lillj.

Dunhevedia setiger, Birge.

Alona quadrangularis, O. F. M.

Without doubt the range of many of these will be extended by further study. A striking example occurred just as this paper was going to press. *Macrothrix rosea*, Jur. was not found in northern Wisconsin, although abundant in the centre of the state and although it was especially sought. Finally a single specimen was found in a pelagic collection from Bayfield at the extreme north of the state

A considerable number of species have been found in southern Wisconsin, whose range has not as yet been extended to the northern part of the state. These are:

Moina affinis, Birge.

Moina flagellata, Hudendorff.

Ceriodaphnia megalops, Sars.

Scapholeberis obtusa, Schdl.

Daphnia pulex, De Geer.

Daphnia microcephala, Sars.

Daphnia longiremis, Sars.

Ilyocryptus sordidus, Liev.

Bosmina longicornis, Schdl.

Bosmina bohémica, Hellich.

Leydigia quadrangularis, Leyd.

Alona tenuicaudis, Sars.

Alonopsis latissima, var. *media*, Birge.

Camptocercus macrurus, O. F. M.

Camptocercus biserratus, Schdl.

Adding these to the former list we have a total of eighty-four species and varieties known to exist in Wisconsin. Of these varieties it may be said that nearly all of them are recognized as species in standard lists of European Cladocera and in comparing the fauna of Wisconsin with that of any other country, most of them must be counted as species.

The list of Wisconsin forms has now become so great that it is not premature to compare our fauna with that of European countries. The following table will show the number of species reported from various countries as compared with the Wisconsin list:

	Bohemia, Hellich, 1878.	Hungary. Daday, 1888.	Denmark. Mulbe, 1867.	Norway. Sars, 1890.	Wisconsin. Birge, 1893.
Holopediidae.....	1	1	1	1	1
Sididae.....	4	3	4	5	5
Daphniidae.....	39	36	19	24*	24
Macrothricidae.....	8	6	6	11	10
Bosminidae.....	5	5	7	15	4†
Lynceidae.....	37	47	31	40	38
Polyphemidae.....	1	1	6	8	1
Leptodoridae.....	1	1	1	1	1
Total.....	96	100	75	105	84

* Besides numerous varieties.

† And several undetermined species.

In comparing the above lists the fact must be noted that Hellich's list for Bohemia and Daday's for Hungary both contain a large number of species of the genus *Daphnia*. Hellich gives twenty-four species of this genus and Daday enumerates eighteen. Many of these are of doubtful value. A certain portion of them can be fairly set against the varieties of that genus included in my total. But after making all deductions

of that sort I have no doubt that the number of the species of that genus which are found in temporary pools is smaller here than in Europe, as the rainfall here is so much less. Sars, who has described so many species of *Daphnia*, reduces the total number for Norway to nine in his latest list. My list includes eleven species and varieties of this genus, and the number should be reduced about one-half in order to compare it fairly with Sars' list.

Norway on the other hand furnishes fifteen species of the genus *Bosmina*. This genus has yielded me only four species. I have a large amount of material, embracing certainly several species, but in the absence of recognizable descriptions and figures of European forms, I hesitate to describe them. Sars also enumerates eight species of Polyphemidæ, which family in Norway shows marine as well as fresh-water species. If we omit these two families from the comparison between Norway and Wisconsin, we shall find for Wisconsin eighty-one species and varieties and for Norway eighty-two species. If we take from Wisconsin's list the varieties of the genus *Daphnia*, we shall be able to compare the lists on a fair basis and may reckon the number of the known species at about seventy-six. This number is so nearly equal to that found in Norway, whose Cladocera are better known than those of any other European country, that it seems fair to compare the fauna of Wisconsin with that of Europe in order to see how many species are common to both sides of the Atlantic and how many are peculiar to America.

The following table shows these relations as I find them. Column I shows the species common to Wisconsin and Europe, II the species peculiar to America, and III the varieties peculiar to America:

	I.	II.	III.
Holopediidæ.....	1	0	0
Sididæ.....	4	1	0
Daphniidæ.....	16	4	4
Macrothricidæ.....	8	1	0
Bosminidæ.....	4	0	0
Lynceidæ.....	29	7	2
Polyphemidæ.....	1	0	0
Leptodoridæ.....	1	0	0
Total.....	64	13	6

Besides these enumerated in the table, one species, *Ilyocryptus longiremis*, Sars, is common to Wisconsin and Australia. It is possible that the forms described in the second section of this paper under the names *D. microcephala* and *D. longiremis*, Sars, are really entitled to rank as independent varieties. If so the totals must be correspondingly altered. It is also to be observed that Imhof has noted* but not described a new species of *Bosmina* from Green lake, Wisconsin.

The facies of our fauna is even more European than these figures would indicate. American varieties of European species need, of course, no comment. They are only slightly different from the European form. The like may be said of many of the Wisconsin forms considered as entitled to specific rank. Many of them are very close to European species, as may be seen from the following list:

*Zoologischer Anzeiger, vol xiv, p. 275.

WISCONSIN.

EUROPE.

<i>Moina affinis</i> , Birge.	<i>M. rectirostris</i> , Jur.
<i>Ceriodaphnia lacustris</i> , Birge.	<i>C. hamata</i> , Lillj.
<i>Ceriodaphnia consors</i> , Birge.	<i>C. laticaudata</i> , P. E. M.
<i>Daphnia minnehaha</i> , Herrick.	<i>D. dentata</i> , Matile.
<i>Bunops scutifrons</i> , Birge.	<i>B. (Macrothrix) serricaudata</i> , Daday.
<i>Alona lepida</i> , Birge.	<i>A. elegans</i> , Kurz.
<i>Pleuroxus denticulatus</i> , Birge.	<i>P. aduncus</i> , Jur.
<i>Anchistropus minor</i> , Birge.	<i>A. emarginatus</i> , Sars.
<i>Chydorus rugulosus</i> , Forbes.	<i>C. gibbus</i> , Lillj.

Besides these, *Ilyocryptus longiremis*, Sars, is close to *I. agilis*, Kurz; *Latonopsis occidentalis*, Birge, is closely allied with Sars' *L. australis* from Australia. The genus has not as yet been found in Europe.

Pleuroxus procurvatus, Birge, and *Chydorus faviformis*, Birge, do not seem to be closely connected with any other known species.

The forms of the genus *Daphnia*, described by Forbes under the name of *D. retrocurva*, are the representatives in this country of the European *D. cucullata* with its varieties, especially *Kahlbergiensis*, Schdl. Perhaps as all our forms are provided with a pectinated caudal claw, it would be well to make of them a separate species. This would then probably bear the name *D. kerusses*, Cox. In any case the Wisconsin forms closely correspond to those of Europe in nature and range of variation of the crest of the head.

It thus appears from the list and comments that the fauna of Wisconsin differs very slightly from that of Europe. No genus thus far discovered here is peculiar to America, and only two of our species lack a close relative in Europe or some other widely separated land. So close is the relation between our species and their foreign allies that we cannot doubt that more careful study of the range of variation shown by the Cladocera will reduce many of our thirteen peculiar species to the rank of varieties.

In a recent paper on the geographical distribution of the

Cladocera,* M. Jules Richard concludes that less than one-half of the species found in North America are peculiar to that country, and that careful revision will reduce this proportion. He gives a list of species found here, using as authority, apparently, Herrick's list in the Minnesota Geological Report for 1884. This list contains a large number of species both from my paper of 1878 and from Herrick's own work, which are unquestionably synonyms of European species. The real relation of the fauna of the north central states of this country can not differ very greatly from the proportions as given in this paper.

In his statement of conclusions to be drawn from the observed facts of the geographical distribution of the Cladocera, M. Richard expresses himself with great caution. Nevertheless, I think that he has gone somewhat further than the facts warrant in even the following cautious opinion:

"Dans plusieurs parties du monde, on trouve des types speciaux, le plus souvent en tres petit nombre, et noyes en milieu d'une foule de formes tres repandus. Nous avons en Europe: *Limnosida*, *Anchistropus*, *Corniger*; en Afrique: *Guernella*, *Grimaldina*; dans l'Amerique du Nord: *Pseudosida*; en Australie: *Latonopsis*."

My own observations show that two of the seven peculiar genera enumerated are found in Wisconsin. *Anchistropus* and *Latonopsis* are represented here by species very close to the Australian and European forms respectively. I have little doubt that *Limnosida* will be found by careful study of our northern lakes. If not, it will be the only European species of *Sididæ* which is not found in this country. *Corniger* is a salt water form of the *Polyphemidæ* from southern Russia. No studies have been made in this country in corresponding latitudes which will warrant the assertion that the genus is not found here, and the same statement may be made regarding the other genera mentioned by M. Richard.

The facts so far as known to me justify the expectation that all genera of Cladocera are intercontinental in their distribu-

*Sur la Distribution Géographique des Cladocères. J. Richard. Received October, 1893, as a separate reprint from a Russian journal, but without name of journal or date of publication.

tion. There probably are exceptions to such a rule, but it is still far too early and our knowledge of the group is far too defective to warrant us in naming this or that genus as confined to one continent.

One further fact mentioned by me in an earlier paper has not been sufficiently considered in connection with the geographical range of the species of Cladocera. This is the wide geographical area over which the species may be found, coupled with a very irregular distribution in that area. As a good example of this fact may be mentioned *Anchistropus minor*, described in the second part of this paper. A single specimen of this species was found by me in lake Wingra in 1890. No second specimen could be discovered although several days were devoted to the search; nor has another individual been seen from this locality in the course of the three years which have passed since the first one was seen. Another single individual was found in Lake Winnebago in 1892 and again I was unable to find another even after most careful dredging in the same place where the first was found. Finally I found the species fairly abundant at Isle Royale. It can not be doubted that *Anchistropus minor* occurs widely throughout the state of Wisconsin and yet it is so rare or local in its distribution that it seems a mere matter of accident whether or not it is reported from a given locality. This case is paralleled by many others in the experience of every collector of Cladocera and illustrates the need of extreme caution in declaring a species absent from a region or from any given lake. My own belief is that most species whose form is not very variable in the locality where they are found, will have an intercontinental distribution. Exceptions will no doubt occur, but the presumption so far as the facts are known to us, is in favor of a wide area of distribution rather than a smaller one.

B. On new or rare species of Cladocera chiefly from Northern Wisconsin.

MOINA AFFINIS, sp. nov.

Plate X, Figures 1, 3, 5, 7, 8, 12, 13, 14.

Female.—The head closely resembles that of *M. rectirostris*, Jur., being somewhat rounded anteriorly, having a deep depression above the eye, and being without an angle on the ventral margin posterior to the antennules. As seen from above, the head is rather long and narrow and shows the supraocular depression very distinctly. The outline of the sides of the head is slightly concave in the middle and the sides round over evenly into the anterior margin. The valves are fringed on the margin with setæ more closely set than in *M. rectirostris*, and are marked by transverse, anastomosing lines, giving an appearance to the shell somewhat like that of a *Simocephalus*. These markings can be seen when the shell is examined uncovered and without water, and also, by careful manipulation, under a cover-glass. These striæ resemble those of *M. Lilljeborgii*, Schdl. as figured by Lilljeborg, ('53,* p. 38, pl. II, f. 4f.), and still more closely those of *M. propinqua*, Sars, as described and figured by him. ('85, p. 31, pl. VI, f. 1.)

The structure of the legs agrees exactly with that of *M. rectirostris*, as described by Gruber and Weismann. ('77, p. 70-72.)

The post-abdomen has a relatively long post-anal portion, which is armed with 9-11 serrate teeth and a bident longer than the adjacent tooth. The caudal claws have a pecten of 12-15 teeth at the base and are denticulate.

The ephippium contains one egg whose long axis is parallel to that of the body. The ephippium is densely reticulated over its entire surface.

The antennules are of moderate size, being apparently somewhat smaller than the figures of *M. rectirostris* would indicate for that species. The usual anterior sense-hair is placed a

* For full titles of papers, see the list at the end of this article.

little proximad to the middle and its length is about one-half that of the antennule. The antennules are fringed on the posterior side by a dense growth of very fine hairs, visible only with a high power of the microscope, but easily disclosed by treatment with osmic acid.

The antennæ resemble in general those of *M. propinqua*.

Transparent, with sometimes a tinge of violet.

Length, 0.8–1 mm. Height, 0.4–0.5 mm.

Male—The male is about 0.3–0.6 mm. in length, and agrees in structure with the usual type of the males of this genus. The antennules are modified into powerful claspers. They are broad at the base in the antero-posterior direction and are inserted near the vertex, so that the head projects but little beyond them. They are geniculate, the angle occurring about 1.5 of the length from their insertion. At the bend are two sense hairs, one short and stout and the other long and slender. There are four hooks at the distal end of the antennule.

The first foot has a hook and is without a flagellum.

The spermatozoa are spherical or oval, and never have radiate projections of protoplasm.

This species is evidently close to the European *M. rectirostris*, Jur. I have been somewhat in doubt as to the specific distinctness of the form, but on the whole I have thought it best to give it a separate name, although recognizing the possibility that the range of variation of *M. rectirostris* will be found great enough to cover this form. It is clear that *M. rectirostris*, Jur., of Europe, *M. propinqua*, Sars, of Australia, and *M. affinis* are very closely allied species. They agree in general form, color and size. All have an ephippium with one egg, and a head with supra-ocular depression. All agree in number and structure of the anal teeth and in the size of the bident. The legs probably agree in structure. Those of *M. rectirostris* and *M. affinis* are alike, but Sars says nothing specific of the structure of those of *M. propinqua* and does not differentiate the European species *M. rectirostris* and *M. brachiata*.

The males of the three species agree in general form. They have the bend of the antennule proximad to the middle of its

length and have two anterior sense-hairs. The first leg lacks the flagellum.

The following differences are found:

	<i>M. rectirostris.</i>	<i>M. propinqua.</i>	<i>M. affinis.</i>
EPHIPPIUM.	smooth in center,	smooth in center,	reticulate.
TERMINAL CLAW,	pectinate,	not pectinate,	pectinate.
VALVE,	smooth or faintly reticulate,	anastomosing striæ,	anastomosing striæ
ANTENNA,	smooth,	villous,	villous.
MALE ANTENNULE,	bend close to middle,	bend close to middle,	bend near head.
TERMINAL HOOKS,	six,	three,	four.
ZOOSPERM.	radiate,	spherical,	spherical.

In view of these differences I have decided to consider this a separate species. It is certainly as distinct as is *M. propinqua* and as species of far-distant countries are so nearly allied it becomes necessary to mark every difference in order that students may note the extent of variation. No doubt later revisers of the genus will reduce the number of species.

This species is of common occurrence in Wisconsin and has probably been found elsewhere in the United States. The descriptions given by Herrick and others are not in sufficient detail to enable one to decide whether the form found was this or the regular *M. rectirostris*.

The species occurs in muddy pools and similar localities after the regular custom of *Moina*.

MOINA FLAGELLATA, Hudendorff, variety.

Plate X, Figs. 2, 4, 6, 9, 10, 11.

This species appeared in a muddy pool in Madison in July, 1892, and in June, 1893. The specimens included males and females with ephippia. These specimens closely resemble the elaborate description given by Gruber and Weismann for this species under the name of *M. paradoxa* ('77, pp. 82, ff). There are some differences which would warrant the separation of the American form as a distinct variety if they should be found constant in specimens from other localities. These are: 1. The shell is marked with striæ, much as in *M. affinis*, Birge. These can be easily seen in clean individuals even under the coverglass.

Gruber and Weismann say of *M. paradoxa* "dass hier von einer polygonalen Felderung durchaus keine Rede sein kann". 2. The basal teeth of the caudal claw are sometimes, though not always, larger than the others and thus give rise to a pecten. 3. The head of the young female is covered with short scattered hairs. In this regard the species resembles *M. banffyi*, Daday ('88, p. 112, Pl. III, fig. 1.); but in that species the hairs are found all over the head and extend upon the carapace, while in all specimens of *M. flagellata*, they are confined to the dorsum of the head. 4. The antennule bears posteriorly numerous long fine hairs. These are not mentioned by any European writer, but are not improbably present, as they are very easily overlooked.

The head of the male projects greatly anteriorly and has no supra-ocular depression. The antennules are angulated at about the middle of their length or a little distad of that point. They bear 5-6 hooks on the outer end. The first foot bears a hook and a long flagellum.

Moina flagellata is readily distinguishable from *M. affinis* at any age and in either sex. The differences between the two species in the female sex are sufficiently striking to enable me to determine the new form at the first glance, although I had never seen it before and did not expect to find it in the pool where it appeared, in which I had been accustomed to collect *M. affinis*.

SIMOCEPHALUS EXSPINOSUS, Koch.

Typical specimens of this species, not before recognized in America, have been found in collections from Green, Twin and Pioneer lakes and from Ashland. I find in Madison specimens resembling *S. vetulus* in all respects except the macula nigra, which is rhomboidal. I am doubtful whether to consider them as belonging to *S. exspinosus* or not. The differences between the two species in outline and serration of caudal claw do not seem to be constant. At least, I find that the form of the head of both *S. vetulus* and *S. serrulatus* is very variable. I also see no constant difference in the caudal claws of *S. vetulus* and *S. exspinosus*.

CERIODAPHNIA LACUSTRIS, sp. nov.

Plate XII, Figs. 6, 7, 8, 9.

Female.—The head is small, greatly depressed and slightly angulated in front of the antennules. The vertex bears numerous small spines at the angle of the reticulations. The fornices are very large, extending out in a broad triangular plate whose apex is blunt and armed with three or four teeth. The valves are ventricose in the posterior ventral portion and the dorsal line is somewhat arched. They are not very strongly reticulated. The posterior spine is well developed and stout. It is occasionally divided at the tip into a right and left part, but usually terminates bluntly with 2-4 teeth. The post-abdomen is somewhat like that of *C. reticulata*, being long and narrow, bearing 6-8 recurved anal teeth, which increase in size toward the posterior end of the abdomen. The caudal claws are long, recurved and denticulate.

The eye is of moderate size and its numerous lenses project far out of the pigment. The macula nigra is small and quadrangular in shape.

The antennules are short and rather thick. They are not much longer than the sense-hairs which they bear. The anterior sense-hair is placed near the apex of the terminal joint. The antennæ are small and slender.

The fornices in this species seem to exceed in size anything before noted in this genus. The distance between the tips of the fornices nearly equals the greatest breadth of the animal. The spine is better developed than is usual in *Ceriodaphnia*. The reticulation of the valves is more plainly marked than in *C. quadrangula*, less strong than in *C. laticaudata*.

The supra-ocular depression is not deep, while the cervical notch is deep.

The color is yellowish-transparent. The species is pelagic, although single individuals may be found in the weedy margins of lakes. It has been found at Madison, Minocqua, Tomahawk lake, Twin lakes, and Rhinelander (lake Julia), all in Wisconsin, and at Gogebic lake, Michigan. Length of female, 1-1.3 mm.

Ceriodaphnia lacustris is perhaps most closely allied to *C. hamata*, Sars (90, p. 36). That species has a similar form and habitat, but differs in the shape of the fornices, which are produced "in spinam procurvatam, hamiformem, sat prominentem." *C. hamata* also lacks the spines on the head. *C. punctata*, P. E. Mueller is also a pelagic species, and agrees with *C. lacustris* in the structure of the head and perhaps in that of the post-abdomen. The antennules, however, are far longer in *C. punctata*, and the fornices are much smaller. *C. pelagica*, Imhof should also be a similar species but I have not been able to refer to Imhof's description.

CERIODAPHNIA QUADRANGULA, O. F. Mueller.

Sars' account of this species ('90, p. 36.) led me to look carefully over my material from northern Wisconsin with reference to it. I conclude that the species is present. I find however, no really trustworthy figures of the species, and it is very difficult to identify it from the conflicting descriptions of various authors. Unquestionably more than one form has been described under this name. There is clearly a form without a pecten on the caudal claw and with no angle in front of the antennule, and another similar but with such an angle. I have called the first form *C. quadrangula* and the second *C. pulchella*, but am not sure of my identifications.

DAPHNIA PULEX, var. PULICARIA, Forbes.

Plate XII, Figs. 1, 2, 3, 4, 5.

A pelagic species of *Daphnia*, found in several localities, seems to belong to this variety, described by Forbes ('93, p. 242, pl. XXXVII, fig. 1). This species agrees in general with *D. pulex*, but is transparent and is found in the open water of lakes and not in muddy pools. A species very close to it is present in temporary pools at Madison. This also differs in color from the typical *D. pulex*. Although dirty it lacks the yellow tint characteristic of the true *D. pulex*. In some lakes a species was found which seemed more closely allied to *D.*

Schoedleri, Sars. It is not improbable, however, that both species are varieties of the same form. The figures show, besides the head of the male, the post abdomen and caudal claw of the female, and two characteristic types of outline of the head of the female.

DAPHNIA KAHLBERGIENSIS Schdl., var. BREVICEPS, var. nov.

Plate XI, Figs. 1, 2, 3, 6.

Female.—The animal is hyaline and the macula nigra is wanting. The species thus belongs to the section *Hyalodaphnia* of Schoedler. The head is small, rounded in front and has a narrow crest. The rostrum is small, but always projects beyond the sense-hairs. The valves are broadly oval in form and are faintly reticulated. The spine is slender and of moderate length. The first and second abdominal processes touch and are slightly united at the base. The post abdomen has the form characteristic of the section *Hyalodaphnia*. It bears 9-10 anal teeth, which are recurved and decrease in size from the posterior end of the row. The caudal claws are provided with the usual two teeth on their anterior (ventral) margin. They have a pecten of fine teeth at the base, extending a little way upon the claw. This is immediately followed by a second pecten of 10-12 coarser teeth, which are longest in the middle. Very fine denticles extend to the end of the claw.

Length, 1.4 mm., including spine of 0.3 mm., height, 0.7 mm.

The male was not found.

The length of the head is variable, but may be a little more than one-fourth of the valves. Its anterior margin varies from a form evenly rounded to one extending into a blunt point, as is shown in the figures. The ventral margin of the head varies from nearly straight to markedly concave, and the rostrum may be merely a blunt, rounded termination or may be drawn out into a well defined pointed, projection. The antennæ are slender and rather weak, not unusually long. When turned back the ends of the setæ do not reach the hinder margin of the valves. The basal joint of the antennæ extends beyond the anterior margin of the head in some individuals and in others falls short

of this margin. The variation depends rather on the form of the head than on the length of the antenna. Spines are found on both the dorsal and ventral edge of the valves. Two embryos were seen in the brood cavity.

The antennary setæ are, as usual, $\frac{2100}{8111}$, and the basal seta of the triarticulate ramus is about as long as that borne on the next joint. In this respect this species differs from most of the species of the section *Hyalodaphnia*.

In all specimens collected the tip of the spine was broken off, but it could not have been much longer than the figure shows it. The spine is slender and resembles that of *D. microcephala*, Sars. The anal teeth are larger than is usual in the section *Hyalodaphnia*. This variety represents, among the American *Hyalodaphniæ*, the European *D. cucullata*, Sars, or *D. apicata*, Kurz. The anal teeth are more numerous than in the European forms and the caudal claws are pectinate.

It is rather difficult to decide whether to call this form a species or a variety. It is very different in shape of head from any known American *Hyalodaphnia* and so far is undoubtedly entitled to specific rank. On the other hand European experience shows that the forms of the section *Hyalodaphnia* are almost indefinitely variable in the shape of the head and that the most extreme forms show connections. It has therefore seemed best to call it a variety only.

This species was found at Tomahawk lake and at Twin lake, Forest county, Wisconsin. It is a pelagic form and as the two localities where it occurs are about thirty miles apart, it may be looked for in other lakes of this region. It was not found at Minocqua, although Kawaquesaga lake, on which that town is located, is continuous with Tomahawk lake.

DAPHNIA MICROCEPHALA, Sars. (?).

Plate XI, Fig. 13.

I have found in collections from lakes Geneva and Delavan, Wisconsin, in material kindly sent me by Prof. S. A. Forbes, of Champaign, Ill., a species which I refer to this species with some doubt. *D. longiremis*, Sars., and this species occur to-

gether in these collections in much the same way as *D. hyalina* and *D. recrocurva* are apt to do. Their numbers, however, are more nearly equal, and in some bottles *D. microcephala* may be the more numerous.

In general form this species closely resembles *D. longiremis*. The valves are perhaps somewhat more elongated, but still are of a broadly elliptical form. The spine projects near the middle of the shell and extends nearly straight backward. It is beset with few and very small spinules. I see no difference between *D. longiremis* and *D. microcephala* in these respects, although Sars' description indicates one.

The head is small; its height is about one-half that of the valves and its free projection is less than its height. It has a slight keel on its dorsal side, which is wider, on the anterior edge. Seen from the side, the head is usually evenly rounded in front but occasionally there is a trace of angulation. There is never an indication of a projection or spine. The ventral margin of the head is straight and rounds over smoothly at the posterior angle. There is practically no rostrum. The sense-hairs of the antennule project below the ventral margin of the head.

The antenna is moderately stout, having about the proportion of that of *D. hyalina*. The seta of the basal joint of the ventral ramus is about as large as its fellows. The eye is of moderate size and of the type seen in *D. hyalina*, having a moderately large amount of pigment. The material at command is not so preserved as to show the other internal organs.

The postabdomen is long and slender. It bears about nine anal teeth. The caudal claws have the usual two spinules on the anterior ventral side and are denticulate. The first and second abdominal processes are slightly united at the base. The second process is about one-half as long as the first. Length 1.3–1.5 mm., including spine.

The descriptions of this species given by Sars and Hellich do not quite agree. The former speaks of a small macula nigra ('63, p. 22.) while Hellich ('77, p. 37.) did not find that structure. He saw the species only once. I have been unable to see the macula nigra, but the condition of the material is such that

a small one may easily be present. Sars now ('90, p. 10, 33.) regards the species as a variety of *D. galeata*. I do not follow him in this as my material does not warrant the change. Indeed I find it difficult to understand his later classification of the species *D. galeata* and *D. hyalina* with their numerous varieties.

DAPHNIA LONGIREMIS, Sars.

Plate XI, Figs. 4, 5, 7, 8, 9, 10, 11, 12.

There is only one description of European specimens of this species, that of Sars ('62, p. 148.). Schoedler ('66, p. 30.) and Eyimann ('86, p. 42.) both take their descriptions from Sars' original account, as also does Herrick ('84, p. 73.). Sars in his later paper makes this species a variety of *D. cristata* ('90, p. 10, 35.).

Sars' account is silent on some points of structure which are quite conspicuous in my specimens, so that I am not sure that they belong to Sars' species, but as they agree in general structure and especially in the great length of the antennæ I prefer to keep them here rather than to make a new species on doubtful grounds.

The specimens examined are pellucid and greatly compressed laterally. The valves as seen from the side are broadly elliptical. The spine is long, very slender, and inserted a little above the middle of the valves and is directed somewhat dorsally. It is armed on the side with small spinules. These extend along the ventral margin of the shell but do not go beyond the base of the spine on the dorsal side. The reticulation of the valves is very indistinct, almost invisible in alcoholic specimens.

The head is small, evenly rounded in front; the ventral margin straight, slightly convex or slightly concave. The rostrum varies greatly, being in some examples a long, pointed nose, and in others practically absent. The figures give a good idea of the range of variation.

The antennæ are very long and slender. When reflexed they extend nearly to the base of the spine but never quite reach it.

They are therefore probably somewhat shorter than in Sars' specimens. The basal joint always projects far beyond the head. Their setæ are not unusually long. The one borne on the basal joint of the ventral ramus is short, only about one-half the length of the others, but is never absent.

The post-abdomen is, as Sars says: "eidem in *D. longispina* sat similis." It is long and slender with 8-14 anal teeth. The caudal claws are denticulate and have two small anterior teeth. The eye is small and the lenses project far out of the pigment. The other internal organs agree with those of the section *Hyalodaphnia*. From 2 to 6 young were observed in the brood cavity. The male was not found.

Length of female, 1-1.5 mm., height, 0.6-0.7 mm.

The species was found abundantly in material from lakes Geneva and Delavan, Wisconsin, with *D. microcephala*.

BOSMINA OBTUSIROSTRIS, Sars, (?)

Plate XII, Figs. 10, 11.

A form identical with Sars' species, or very closely allied to it, was collected by Miss H. Merrill near Woods Holl, Mass., in a pool in Fay's Wood.

Female—Length, 0.6 mm.; height, 0.43 mm.

The head in front of the eye is very protuberant, but in a peculiar manner. The elevation passes gradually into the dorsal outline but ventrally is bent abruptly in toward the antennules. The ventral line of the protuberance in aged individuals makes nearly a right angle with the anterior margin of the antennule. The rostrum is nearly obsolete. The sense-hair is situated at the point of attachment of the antennules. The antennules are short, slightly curved, and in the adult show only very faint traces of "joints" in alcoholic specimens. The sense-hairs are about one-third of the distance to the tip. In young specimens, still sexually immature, the antennules are relatively long, strongly curved and show 12-14 joints beyond the sense-hairs. At this time they are as long, absolutely, as in the

adult. The ocular protuberance is much less marked and the rostrum better developed.

The shell is plainly striate in the dorsal portion. The mucro is long, directed obliquely downward and in the adult is smooth. In the young some specimens have it smooth and others have two notches on the *dorsal* side.

The antenna in the adult is very short, hardly projecting beyond the beak. The postabdomen shows two or three well-marked rows of small teeth at the infero-posteal angle and a pecten of 6-8 teeth on the caudal claw. The eye is of moderate size and the lenses project but little beyond the pigment.

The male was not present in the collection.

Bosmina obtusirostris was first described by Sars ('62, p. 153,) from Norway. It has since been reported from Lapland by Richard ('89, p. 5.), from Siberia (Tobolsk) by De Guerne and Richard ('91b, p. 234.), and by Poppe and Richard ('90, p. 78.), as possibly occurring in China. Sars ('90, p. 11, 40.), mentions it again from Norway with two varieties, *major* and *alpina*. *Bosmina brevisrostris*, P. E. Mueller ('68, p. 97.), has been generally considered identical with *B. obtusirostris*, but Sars ('90, p. 40.), regards the two species as distinct.* *Bosmina arctica*, Lillj, is a very closely allied species according to De Guerne and Richard.

It is of course very difficult to identify species of this genus and I am not confident of the correctness of this identification although it is evident that this species is very close to *B. obtusirostris*. There is only one description of the species, that given by Sars originally. This account agrees with my specimens so far as it goes, but is rather brief, and no figures of the species have been published. No description mentions the singular form of the ocular protuberance or the unusual position of the teeth of the mucro in the young.

*Sars quotes the species as *B. brevicornis* P. E. M., but Mueller has no such species in any paper known to me. *B. brevicornis* was described by Hellich, '70, p. 60.

BUNOPS,* gen. nov.

Plate XIII. Fig. 1.

The head is very small and extends anteriorly much as in *Drepanothrix*. The forehead is flattened, somewhat kite-shaped as seen from the front, and has a nearly hemispherical elevation in the center behind which lies the eye. The valves are nearly round, compressed, crested on the dorsal margin, and extend posteriorly into a blunt semicircular projection, ventrally the valves gape in front and about the middle of the ventral margin are folded in toward each other. This infolding continues to the posterior end of the margin. Its effect is to enable the posterior part of the valves to touch each other and so close the branchial cavity behind. The free edge of the valves is fringed in front with long, slender, straggling hairs, while posteriorly they are short and closely set. At the posterior portion of the shell these hairs are apparently above the margin, owing to the fact that the infolded portion of the valve extends dorsally as well as toward the median line. The shell bears hexagonal reticulations, more distinct on the head and in the ventral part of the valves.

The post-abdomen is broad, compressed and rounded as seen from the side. It is divided by a notch into a pre-anal and a post-anal portion. The posterior, dorsal, margin of the pre-anal part is convex and armed off the edge with 6-7 small recurved teeth and on the sides with 2-3 rows of fine hairs. There is a small but well marked abdominal process. The anal region bears 2-3 small teeth on each side. The caudal claws are curved, stout and denticulate and situated on a small conical terminal projection.

The antennules are long, slender and cylindrical, bearing an anterior sense-hair, two pairs of posterior sense-hairs, and terminal sense-hairs which number about 11 and are of equal length. The antenna is of moderate length, slender and rather weak. The setæ are 3000-311. The basal seta is the longest but is

* βουνός, elevation and ὤψ, eye.

not notably stout. All setæ usually appear smooth but sometimes there are visible very fine teeth on the basal seta and scattered hairs on the others.

The eye is of moderate size, as is the macula nigra. The latter is quadrangular in shape. The intestine is straight and there are no hepatic coeca. The first foot in the female has a strong hook. The labrum carries a strong triangular process.

Two species of this genus are known, *Bunops serricaudata*, Daday,* and the present form which I have called *Bunops scutifrons*, sp. nov.

The species are distinguished by the fact that in *B. serricaudata* the crest is serrated posteriorly, while in *B. scutifrons* the crest is smooth. Length 0.8-1.3 mm.; height 0.5-0.8 mm.; transparent.

The species was found in lake Kawaquesaga at Minocqua, in shallow water among *Utricularia*, and also in ditches near outlet of lake Wingra, Madison. This species is the subject of a separate paper in this volume by Miss. H. Merrill, of Milwaukee. For the detailed description of the animal, reference is made to this paper.

STREBLOCERUS SERRICAUDATUS, Fischer.

This species, hitherto not recognized in the United States, I have found in a marshy pool at Rhinelander, Wis., in shallow water at Minocqua, Wis., at Washington Harbor, Isle Royale, and in collections from Quissett, Mass. It is therefore probable that it is widely distributed in the northern part of this country.

My specimens agree very closely with the descriptions and figures of Matile ('90, p. 34). The antennules bear on the convex side four strong sensory setæ and have no cross rows of hairs. On the ventral edge of the shell are numerous stout, stiff setæ, apparently immovable. Between these are others, more slender and movable, which ordinarily project inward and so guard the opening between the valves. The post-abdomen also agrees with the description of Matile.

* *Macrothrix serricaudata*, Daday. ('88, p. 105, P. II, f. 46-48.)

ACANTHOLEBERIS CURVIROSTRIS, O. F. Mueller.

This large species, not before recognized in the United States, occurred in large numbers in a marshy pool near Minocqua and at several other localities between that town and Tomahawk, Wis.

All the European genera of Macrothricidæ have now been found in Wisconsin. They are represented by ten species, while in Europe fourteen have been described, but no single country has yielded more than nine. Of the ten, eight are identical with the European forms. One species, *Ilyocryptus longiremis*, Sars, is identical with an Australian form, although close to the European *I. agilis*, Kurz. *Bunops scutifrons*, Birge, is very close to *B. serricaudata*, Daday. With this exception, all the European genera which contain only one species are represented in this country by the same species. Of European forms which might be expected to occur in this country, there have not yet been found *Macrothrix hirsuticornis*, N. and B., and *Ilyocryptus agilis* and *acutifrons*, Kurz.

Macrothrix laticornis seems to be the most common European form. In Wisconsin, *M. rosea*, in a form close to *M. tenuicornis*, Kurz, is by far more abundant. In collections from Starkville, Miss., *M. laticornis* was present in great numbers and *M. rosea* was absent.

Ophryoxus gracilis, Sars, is very generally distributed through the state, as is *Lathonura rectirostris*, O. F. M. *Acantholeberis* I have found only at the more northern stations. I have never found it in southern Wisconsin although I have looked carefully for it. I hesitate to say, however, that the species is not found here. In a recent paper I stated that *Polyphemus pediculus* is very rare in Madison. This had been true ever since I began to collect, more than twelve years ago. But last season it appeared in great numbers in waters which certainly did not contain it before. It is therefore not at all impossible that a similar discovery may be made for *Acantholeberis*.

Drepanothrix dentata, Euren, has been found only in lake Wingra, Madison, Wisconsin, and at Washington Harbor, Isle Royale, Michigan. It probably occurs in the region between these points, which are separated by more than 300 miles.

ALONA FALCATA, Sars.

Plate XIII, Figs. 9, 10.

This species was found not very rare in dredgings from shallow water in Washington Harbor, Isle Royale and in lake Gogebic, Michigan. There are some minute differences between my specimens and some of the European descriptions. Sars' account ('62, p. 162,) is more like our form than are those of P. E. Mueller ('68, p. 183,) or Hellich ('77, p. 95). Both of these authors are less accurate in their account of the posterior margin of the valves than is the original description of Sars. There is a distinct dorso-posteal angle, and the margin is sinuate. The infero-posteal angle is rounded and the teeth, which number 1-3, are set, not on the margin but a little within it. The cilia of the ventral margin are long, especially at the anterior and posterior ends.

The post-abdomen is well described by Sars as "crassum fere teres." The dorsal lower margin is carried almost parallel to the ventral margin of the valves and the organ is used in locomotion somewhat as it is employed by *Dunhevedia*.

ALONELLA ROSTRATA, Koch.

1878, Birge, *Pleuroxus acutirostris*; p. 23, pl. II, f. 15.

This species was found at Minocqua, and more abundantly from Isle Royale and also in collections from Easthampton, Mass. It has not been recognized before in this county although I earlier described it as a new species of *Pleuroxus*. Its affinities are more nearly with *Pleuroxus* than with *Alona*. The single spine of the postabdomen is the chief character in common with *Alona*, while shell markings and beak are *Pleuroxine*. I see no ground for including the forms with short beaks—*P. excisus* and *exiguus*—in the same genus with this distinctly long-beaked form.

PLEUROXUS NANUS, Baird.

This minute species was found in Green lake, at Minocqua and New Lisbon, Wis., and at Isle Royale. It has been reported from Minnesota by Herrick.

PLEUROXUS HASTATUS, Sars.

Plate XIII, Fig. 11.

A form which, on the whole, seems to me to belong to this species was found in a marshy pool near New Lisbon, Wis. In general shape and proportions it resembles *P. gracilis*, Hud., and thus is much longer than high. In this respect it differs greatly from P. E. Mueller's figure of *P. hastatus*, and in less degree from the figures and measurements of Hellich, Kurz and Norman and Brady. Hellich is the only author who gives dimensions of both height and length. His results are, length, 0.55–0.6 mm., height, 0.32–0.35 mm. My largest specimens measure 0.51 mm. by 0.22 mm. They are nearly as long as those of Hellich but only about two-thirds as high. In spite of this difference I consider the species the same. The posterior margin of the shell has the same form as that of the European specimens. The same is true of the size, shape and armature of the postabdomen, the length of the beak and the proportions of the antennules.

European authors differ regarding the cilia of the ventral edge of the valves. Kurz (74, p. 66) places them in the middle only. Hellich (77 p. 102), figures them along the entire ventral margin, only slightly shorter at the posterior end. Mueller ('68 p. 193, P. III, f. 25), apparently sees them about like Hellich. I find that they almost but not quite disappear at the posterior end of the valves, but are much the same as in most species of *Pleuroxus*.

The marking of the valves in alcoholic material consists of striae anteriorly and obscure reticulations behind. In some specimens the posterior part of the valves seems obliquely striated as in so many of the species of this genus.

Material collected in 1893 from northern Wisconsin by Mr. L. S. Cheney contains specimens which leave no doubt of the specific identity of this form with *P. hastatus*.

CHYDORUS FAVIFORMIS, sp. nov.

Plate XIII, Figs. 7, 8.

Female.—The form is in general similar to that of *C. sphaericus*. The shell of the head and body is covered with deep polygonal cells, formed by outfoldings of the outer layer of the valves. These give the shell an appearance like a honeycomb, whence the specific name. The postabdomen is broad, the end rounded and the anal projection large. There are 9-10 post-anal teeth. The terminal claws are serrate and bear one basal tooth.

This species is transparent and yellowish. Length, 0.5-0.6 mm.

Found in shallow water in the lakes at Minocqua and at Twin lakes, Wis., and in Gogebic lake, Mich. This remarkable species was first seen at Minocqua, where cast shells were found and afterwards living specimens in abundance. The main peculiarity of the species is the development of the deep pits on the surface of the shell. These are identical with the structures occasionally seen in other species of Lynceidæ. Leydig ('60 p. 224) says of *Pleuroxus trigonellus*: "Als etwas besonderes fiel mir noch auf, dass bei der Seitenlage des Thieres (und unter starker Vergrößerung) auf der Wölbung des Kopfschildes sich ein eigenthümlicher, zarter, senkrecht gestellter Hautsaum hinzieht, ungefaehr auf der Mitte des Scheitels beginnend und bis in der Herzgegend sich erstreckend."

Schoedler ('63, p. 45.), noted the same fact. P. E. Mueller ('68, p. 190.), observed the same structure in this species and also in *P. personatus*, in which he figured it (P. IV, f. 23.), and showed that it consists of hexagonal cells corresponding to the reticulations. Kurz ('74, p. 68.), correctly explained and figured it in *P. trigonellus*, (P. III, f. 5). Hellich ('77, p. 104.), noted it in *P. trigonellus*. Matile ('90, p. 54.), described the occurrence of the "Cuticularsaum" in *P. trigonellus*, *personatus* and *aduncus*, and in *Chydorus sphaericus*.

In all these cases, which include all the references I have been able to find, the cells are very shallow and their walls extremely delicate, so that they are hard to see. They thus differ widely in degree from the conspicuous cells of *C. faviformis*, which are the most noticeable facts in its structure. The walls of the cells stand at right angles to the surface of the shell, and as this is nearly globular, the cells widen considerably toward the exterior. The cells are smallest in the anterior part of the valves just below the junction of the fornices, and their walls are lowest at the same point. Here is the region where the antennæ rub against the shell when reflexed. The largest cells are in the dorsal posterior region, where they may be 0.07 mm. in diameter and 0.05 mm. in depth. There is a row of smaller and somewhat irregular cells along the line of junction of the shell of head and body.

The cells are often inhabited by a species of *Vorticella*, which when disturbed withdraws at once into the protection of the cavity. The animal is not as much overgrown with parasites as would be expected from the structure of the shell. Indeed, very little was noticed except the *Vorticella*. Probably the frequent changes of the shell are the cause of this freedom from parasites. In examining the material collected by the dredge, far more cast shells of this species are found than of *C. sphaericus*, while the proportion of living animals is the other way. The post-abdomen and appendages show nothing peculiar. They closely resemble the corresponding parts of *C. sphaericus*.

Chydorus faviformis lives in shallow water in lakes in northern Wisconsin. It was particularly abundant among a plentiful growth of *Utricularia* near the southern railroad trestle of the Milwaukee and St. Paul R. R., in the vicinity of Minocqua.

CHYDORUS RUGULOSUS, Forbes.

Plate XIII, Fig. 6.

A species of *Chydorus* apparently the same as that of Forbes was found at Washington Harbor, Isle Royale. It is probably also identical with Lilljeborg's *Chydorus gibbus* (Sars, '90, p. 50).

I do not know whether Forbes' ('90, p. 712) paper was issued earlier in the year than Sars' or not. In any case both species had been described by their author some years before the publishing of the papers referred to.

The shell is highest in the middle, "dorso medio distincte angulato vel gibbo" (Sars). "The anterior dorsal surface is flattened, meeting the flattened valves at an acute projecting angle, giving the shell a trigonal form like a beech nut" (Forbes). This shape is best seen when the animal is viewed obliquely from above. The posterior dorsal margin slopes steeply down to the posterior margin, which it meets at a rounded angle. The posterior margin rounds over into the ventral. The marginal hairs are stout.

The head is small, movable, and in many of my specimens the apex of the beak was curved slightly forward. The macula nigra is larger than the pigment of the eye, and is nearer the latter than to the apex of the rostrum. I have not seen it twice as far from the rostrum as from the eye.

The shell is reticulated with hexagonal meshes. I have been unable to find the minute rugosities of which Forbes speaks. The outlines of the regular meshes are sometimes resolvable into minute elevations. The valves are always somewhat dirty and rough.

The post-abdomen is large, broad, with 8-10 stout teeth. The anal tubercle is large, forming an acute projection. The caudal claws are smooth. Length, 0.5 mm. Height, 0.37 mm.

ANCHISTROPUS MINOR, sp. nov.

Plate XIII, Figs. 2, 3, 4, 5.

In my former paper on the Cladocera of Madison (Birge, '91, p. 380) I stated that "a single specimen was found in lake Wingra, belonging to the genus *Anchistropus*, Sars, and apparently not to the species *emarginatus*, Sars. It was accidentally destroyed before it could be carefully studied." Other specimens have been obtained in dredgings from lake Winnebago, near Oshkosh, and from Gogebic lake, Michigan, so closely re-

sembling the sketches of the first specimen that the conclusion regarding the distinctness of the species seems warranted and it is described under the above name.

Female.—The general form is rotund, resembling that of *Chydorus*. The head is large, movable, much depressed. The fornicies are broad and extend out into a broad, pointed flap of a rostrum, which can be closely appressed to the valves. The dorsal outline is evenly arched to the posterior margin which is very short, practically absent. The posterior part of the ventral margin rounds over into the dorsal with only a slight break and is fringed with somewhat straggling plumose hairs, longest in front. As seen from below the valves touch about the middle of the ventral edge and are slightly separated at the posterior part. They also touch each other anteriorly. In the middle third of the length, the edge of each valve, instead of bending in toward the median line, is turned out, so that a rhomboidal space is here left between the valves. Just posterior to the center of the fold there is a sharp unfolding of the valve, forming a groove whose walls are produced ventrally so as to form a sort of curved hollow tooth. In the cavity of the larger fold lies the first foot and in the tooth lies the spine of this foot.

The anterior margins of the valves are strongly convex, but not so tumid as is figured in *A. emarginatus* by Norman and Brady ('67, P. XIX, Fig. 4). This structure of valves and first foot, which is characteristic of the genus, is less fully developed in *A. minor* than in *A. emarginatus*. In Norman and Brady's figure the unfolding for the spine extends far back toward the posterior edge of the valve, and the spine is at least six times as large as in my specimens, where indeed it was difficult to discover it. The hook of the first foot is said by Sars to be "validus." Norman and Brady call it a "long, cylindrical falcate process, denticulate on the edge, which is very conspicuous." In none of my specimens was this true, but the hook is not very large, nor was it conspicuously exerted.

The antennules are short conical, and bear the usual anterior sense-hair and cluster of terminal sense-hairs which are about equal in length. The antennæ have $\frac{3}{11}$ setæ and have no

spines. The eye is large, and the macula nigra is about one-half as large. The process of the labrum is little developed. The length of the animal is about 0.36 mm. The male was not found.

No species of this genus has been found in America before. Herrick ('84 p. 118) speaks of a *Chydorus*-like form seen once by him, which had several young in the brood-cavity. It could therefore scarcely have belonged to this genus where there are only two young. His suggestion that *Anchistropus* is possibly a male *Chydorus* is certainly incorrect.

ACROPERUS LEUCOCEPHALUS, Koch.

ACROPERUS ANGUSTATUS, Sars.

Both of these species appear in my collections, as do forms in some respects intermediate between them. I have long been puzzled by the species of *Acroperus* found at Madison, as it seemed to approach *A. leucocephalus* in some respects and *A. angustatus* in others. In 1892 I received specimens of the genus from Cambridge and Easthampton, Mass., and collected them in Green lake and at Minocqua and other points in northern Wisconsin. All of the Massachusetts specimens are typical *A. leucocephalus* and entirely resemble the European descriptions and figures. Specimens from northern Wisconsin are nearly typical *A. angustatus*. The form from Green lake appears to have a higher cephalic crest than do those from any other locality. In no case do I find the antennæ quite as short as is required by the description of Hellich ('77, p. 80.).

In lake Gogebic and elsewhere both species occur together. In such cases I have failed to find intermediate forms.

In the ordinary form at Madison the dorsal line is somewhat arched, the posterior angles are less prominent than in typical *angustatus* and the antennary setæ reach nearly to the posterior edge of the valves. In all these particulars they approach *leucocephalus*, while in general form and in most other respects they resemble more nearly *angustatus* and should probably be ranked with that species.

There is no constant difference between the species in size, color or transparency. Hellich says that the striae are not so closely set in *angustatus* as in *leucocephalus*. In my specimens the reverse is true although the difference is not great. The figures of P. E. Mueller (P. III, f. 15, 18.) show the facts as I find them. Mueller ('67, p. 169.) says of *A. angustatus* "margo ventralis * * * * postrema parte glabra." Hellich's figure of *angustatus* shows it ciliate to the tip. My specimens show a similar arrangement.

The antennary setae in my specimens of *A. leucocephalus* do not quite reach the posterior edge of the valves when the antennae are reflexed. In many specimens of *A. angustatus* they are as long as in many individuals of the other species. The crest of the head is very variable in both sexes. The post-abdomen affords no constant characters for distinguishing the species.

On the whole there seem to be two fairly well marked forms of the genus *Acroperus*; but general shape and appearance are the only means for discriminating them, as the characters relied upon by different authors for specific marks are not constant. The straight dorsal margin, the short antennae, and the position of the postea teeth, are characteristic of *A. angustatus*, but these structural features show considerable variation in the direction of the corresponding structures of *A. leucocephalus*.

MONOSPILUS TENUIROSTRIS, Fischer.

This species occurred in dredgings from Twin lakes, Tomahawk lake, and lake Julia, Wisconsin. I have also received it in collections from Easthampton, Mass., and Isle Royale, Mich. Herrick reports it from Minnesota.

In all my bottles cast shells were far more plenty than animals. The cast shell shows clearly that the affinities of the genus are with *Alona*. It is well known that the relation of the shell of the head to that of the valves varies greatly in the *Lynceidae*. In *Alona* and allied genera, as *Acroperus* and *Camptocercus*, the suture marking the junction of the shell of

the head with that of the body follows the extension of the anterior edge of the valves and runs nearly perpendicular to the long axis of the animal. In *Pleuroxus*, *Chydorus* and allied genera, this line runs far back toward the posterior end of the valves. *Monospilus* belongs very plainly to the first group of genera.

LIST OF PAPERS TO WHICH REFERENCE IS MADE.

- BIRGE, '78. Notes on Cladocera: E. A. Birge, Madison, 1878. Trans. Wis. Acad., vol. IV.
- BIRGE, '91. List of Crustacea Cladocera from Madison, Wis.: E. A. Birge, Madison, 1891. Trans. Wis. Acad., vol. VIII.
- DADAY, '88. Crustacea Cladocera Faunæ Hungaricæ: E. Daday de Dees, Budapest, 1888.
- EYLMANN, '86. Beitrag zur Systematik der Europaischen Daphniden: E. Eylmann, Freiburg i. B., 1886. Ber. Naturforsch. Gesellsch. zu Freiburg, B. II.
- FORBES, '90. On some Lake Superior Entomostraca: S. A. Forbes, Washington, 1890. Rept. Fish Com., 1888.
- FORBES, '93. A preliminary Report on the Aquatic Invertebrate Fauna of the Yellowstone National Park, Wyoming, and of the Flathead Region of Montana: S. A. Forbes, Washington, 1893. Bull. U. S. Fish Com., 1891.
- GRUBER AND WEISMANN, '78. Ueber neue oder unvollkommen gekannte Daphniden: A. Gruber and A. Weismann, Freiburg, 1878. Ber. Naturforsch. Gesellsch. zu Freiburg.
- DE GUERNE ET RICHARD, '91b. Entomostrâces recueillis par M. Ch. Rabot en Russie et en Sibirie: J. de Guerne et J. Richard, Paris, 1891. Bull. Soc. Zool. France, 1891.

- HELLICH, '76. Die Cladoceren Boehmens: M. C. Bohuslav Hellich, Prag, 1877.
- HERRICK, '84. The Crustacea of Minnesota included in the orders Cladocera and Copepoda: C. L. Herrick, Minneapolis, 1884. 12th Annual Report Geol. and Nat. Hist. Sur. Minn.
- KURZ, '74. Dodekas neuer Cladoceren, nebst einer kurzen Uebersicht der Cladocerenfauna Boehmens: W. Kurz, Wien, 1874. Sitzungsber. Akad. der Wissensch. Wien, B LXX.
- LEYDIG, '60. Naturgeschichte der Daphniden: F. Leydig, Tuebingen, 1860.
- LILLJEBORG, '53. De Crustaceis ex ordinibus tribus: Cladocera, Ostracoda et Copepoda, in Scania occurrentibus: W. Lilljeborg. Lund., 1853.
- MATILE, '90. Die Cladoceren der Umgegend von Moskau: P. Matile. Moscow, 1890.
- MUELLER, '68. *Danmarks Cladoceren: P. E. Mueller. Copenhagen, 1868.
- NORMAN AND BRADY, '67. A Monograph of the British Entomostraca belonging to the Families Bosminidæ, Macrothricidæ, and Lynceidæ: A. M. Norman and G. S. Brady. Nat. Hist. Trans. Northumberland and Durham, London, 1867.
- POPPE AND RICHARD, '90. Note sur divers Entomostraces du Japon et de la Chine: S. A. Poppe et J. Richard. Bull. Soc. Zool. France., vol. XV, 1890.
- RICHARD, '89. Note sur les peches effectuees par M. Ch. Rabot dans les Lacs Enara, Imandra, et dans le Kolozero: J. Richard, 1889. Bull. Soc. Zool., France, 1889.
- SARS, '62. Om Crustacea Cladocera, jagttagne i Omegnen af Christiania: G. O. Sars, Christiania, 1862. Forh. Vidensk. Selsk. i Christiania, 1861.

*I follow the general custom in dating this work 1868. My own copy, a separate reprint, is dated 1867.

- SARS, '63. Om en i Sommeren 1862 foretagen Zoologisk Reise: G. O. Sars, Christiania, 1863.
- SARS, '85. On some Australian Cladocera raised from Dried Mud: G. O. Sars, Christiania, 1885, Forh. Vid.-Selsk. i Christ., 1885, No. 8.
- SARS, '90. Oversigt af Norges Crustaceer; II: G. O. Sars, Christiania, 1890, Ibidem, 1890, No. 1.
- SCHOEDLER, '63. Neue Beitrage zur Naturgeschichte der Cladoceren: Ed. Schoedler, Berlin, 1863.
- SCHOEDLER, '66. Die Cladoceren des frischen Haffs: E. Schoedler, Berlin, 1866. Wiegmann's Archiv fuer Naturgeschichte, Jg. XXXII.

EXPLANATION OF PLATES.

PLATE X.

- Fig. 1. *Moina affinis*, Birge. Post-abdomen of female. $\times 175$.
2. " *flagellata*, Hud. Post-abdomen of female. $\times 175$.
3. " *affinis*. Antennule of male. $\times 150$.
4. " *flagellata*. Antennule of male. $\times 150$.
5. " *affinis*. Young female. $\times 65$.
6. " *flagellata*. Anterior part of female, showing hairs of dorsum of head. $\times 65$.
7. " *affinis*. Male. $\times 65$.
8. " *affinis*. Reticulation of shell. $\times 250$.
9. " *flagellata*. Head of female from above. $\times 65$.
10. " *flagellata*. Ehippium. $\times 65$.
11. " *flagellata*. Male. $\times 65$.
12. " *affinis*. Antennules of male from below. $\times 65$.
13. " *affinis*. Head of female from above. $\times 65$.
14. " *affinis*. Ehippium. $\times 65$.

PLATE XI.

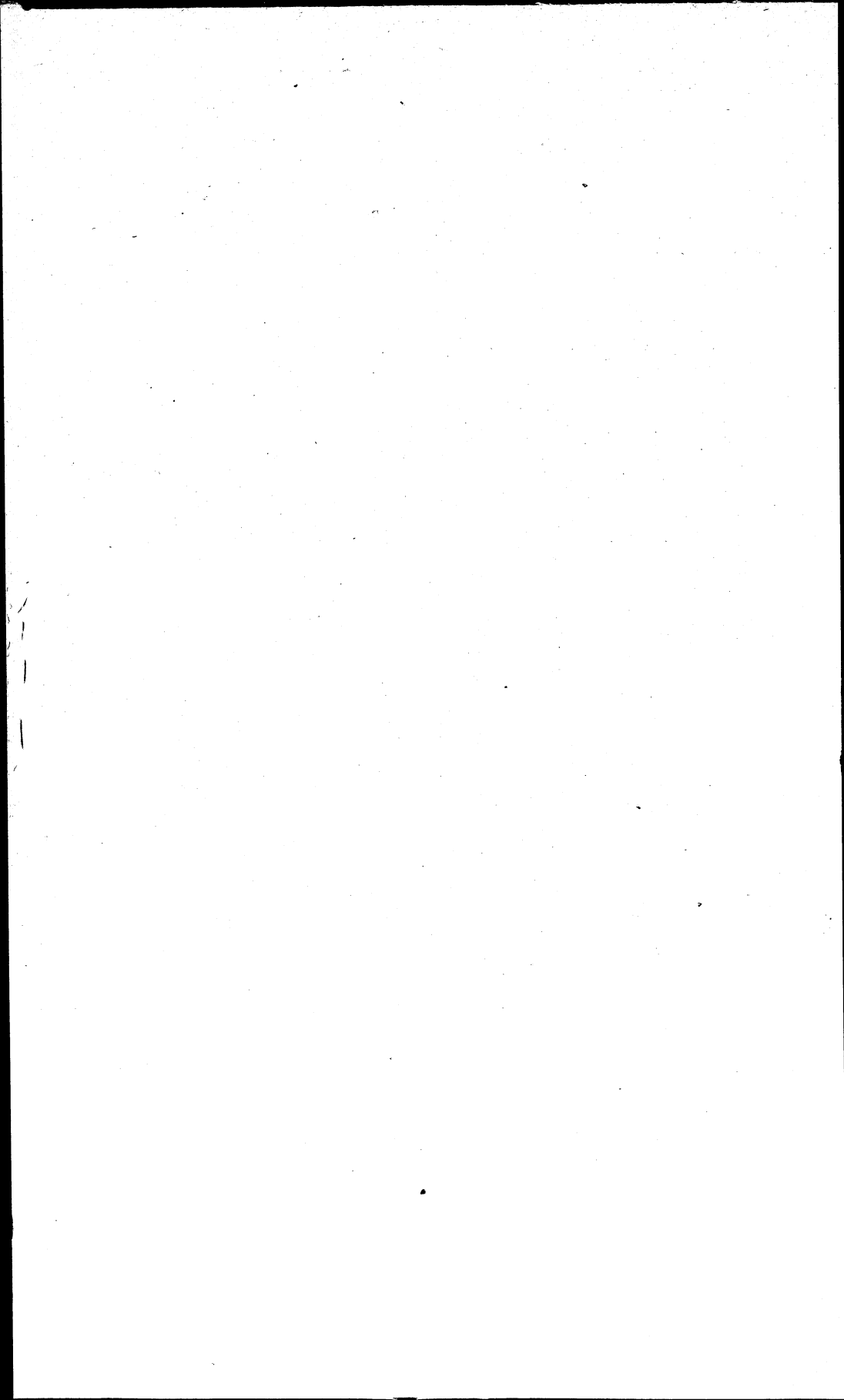
- Fig. 1. *Daphnia Kahlbergiensis*, Schdlr., var. *breviceps*, Birge. Female. $\times 60$.
2. " *breviceps*. Apex of post-abdomen. $\times 250$.
3. " *breviceps*. Head. $\times 65$.
- 4, 5, 7, 8, 9. *Daphnia longiremis*, Sars. Various forms of head. $\times 65$.
6. *Daphnia breviceps*. Head. $\times 65$.
10. " *longiremis*. Female. $\times 65$.
11. " *longiremis*. Post-abdomen. $\times 100$.
12. " *longiremis*. Female from above. The antennæ in this specimen were shorter than is usual. $\times 40$.
13. " *microcephala*, Sars. Head of female. $\times 100$.

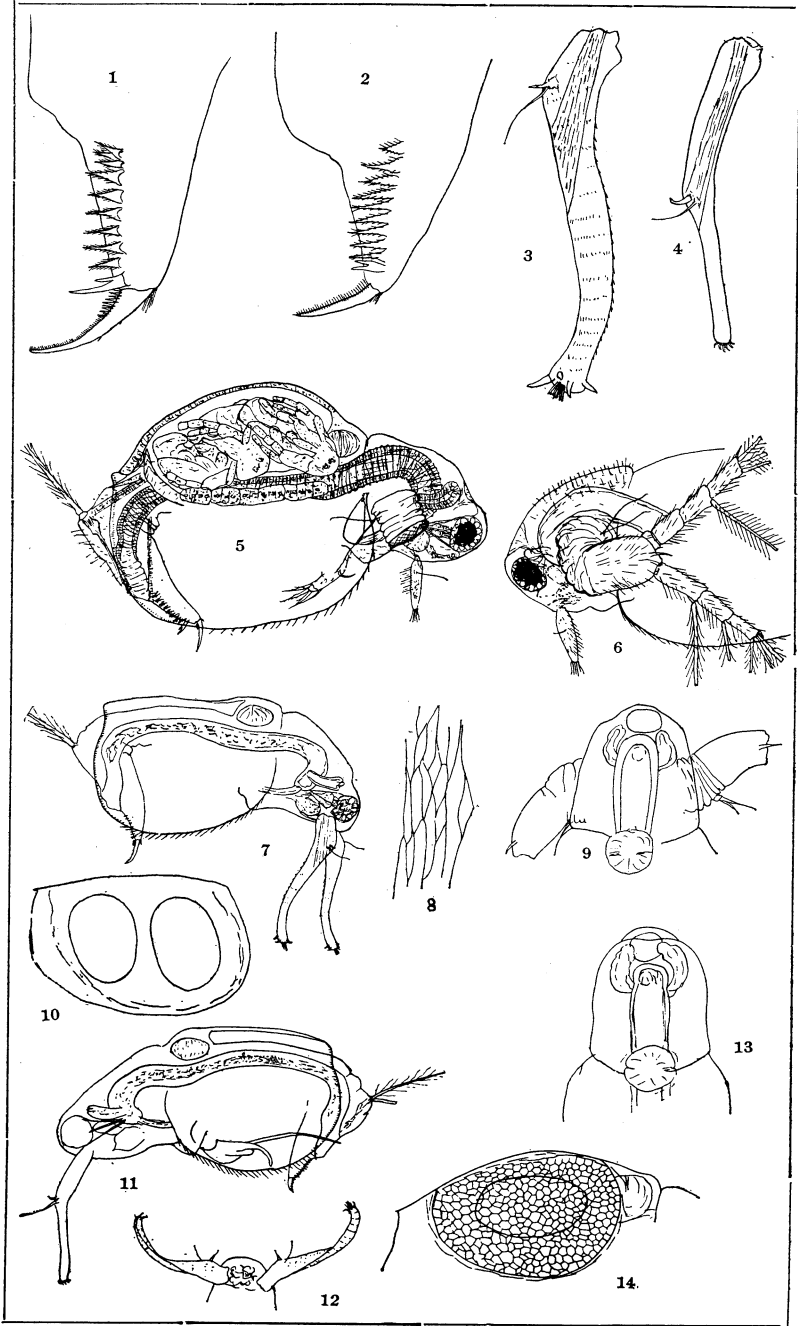
PLATE XII.

- Fig. 1. *Daphnia pulex*, var. *pulicaria*, Forbes. Caudal claw. $\times 250$.
2. " *pulicaria*. Head of male. $\times 160$.
3. " *pulicaria*. Post-abdomen of female. $\times 40$.
- 4, 5. " *pulicaria*. Outline of head of female. $\times 40$.
6. *Ceriodaphnia lacustris*. Female. Small specimen. $\times 65$.
7. " *lacustris*, Birge. Anterior part from above. $\times 65$.
8. " *lacustris*. Head of female showing spinules. $\times 175$.
9. " *lacustris*. Apex of post-abdomen. $\times 175$.
10. *Bosmina obtusirostris*, Sars. Young. $\times 75$.
11. " " Female. $\times 75$.

PLATE XIII.

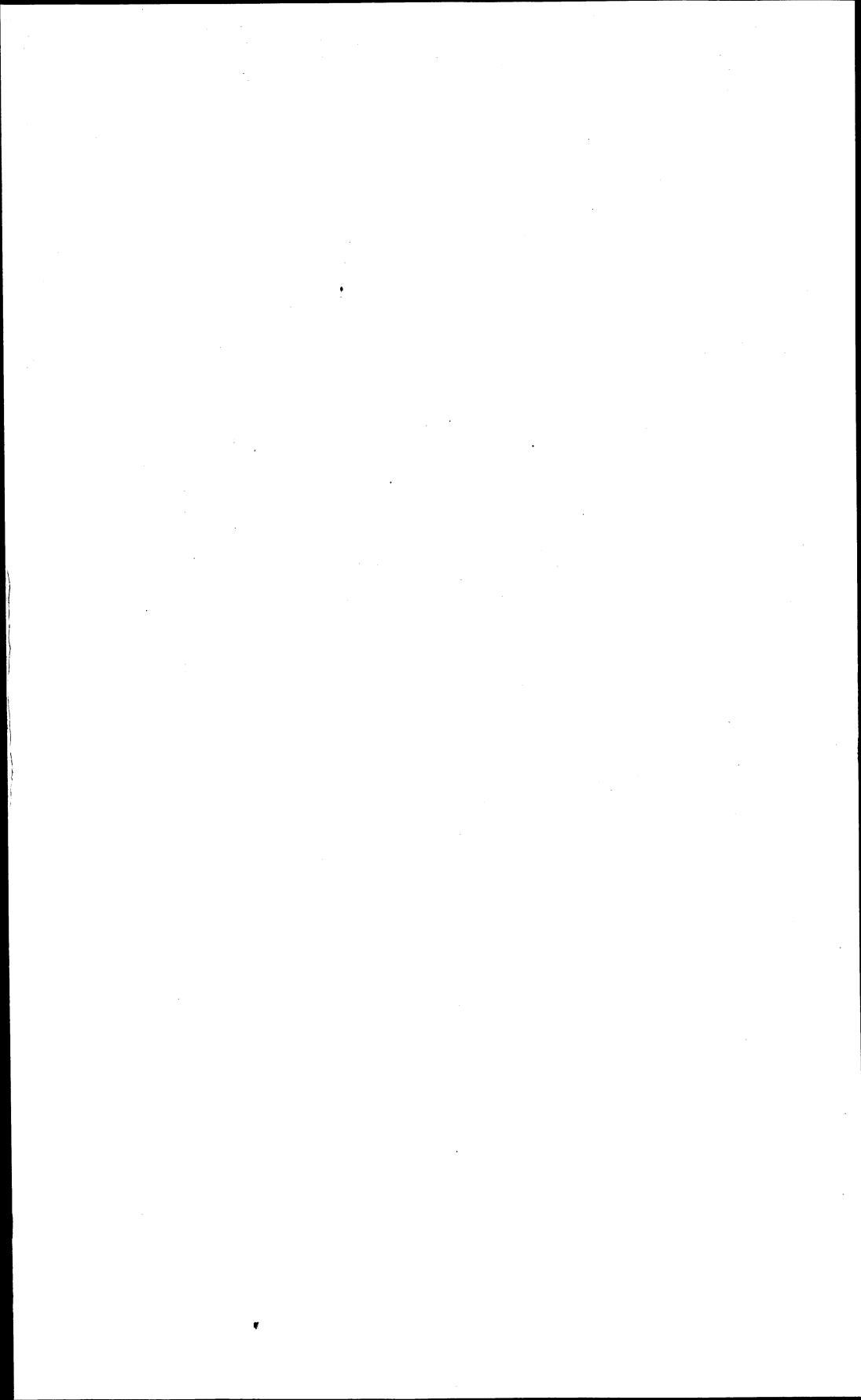
- Fig. 1. *Bunops scutifrons*, Birge. Small female. $\times 65$.
2. *Anchistropus minor*, Birge. Female from below. $\times 120$.
3. " " Claw of first foot. $\times 260$.
4. " " Anterior part of valve. $\times 120$.
5. " " Post-abdomen. $\times 260$.
6. *Chydorus rugulosus*, Forbes. Female. $\times 100$.
7. " *faviformis*, Birge. Cast shell of young female. $\times 100$.
8. " *faviformis*. Post-abdomen. $\times 260$.
9. *Alona falcata*, Sars. Female. $\times 100$.
10. " " Sars. Head from below. $\times 100$.
11. *Pleuroxus hastatus*, Sars. Female. 65.

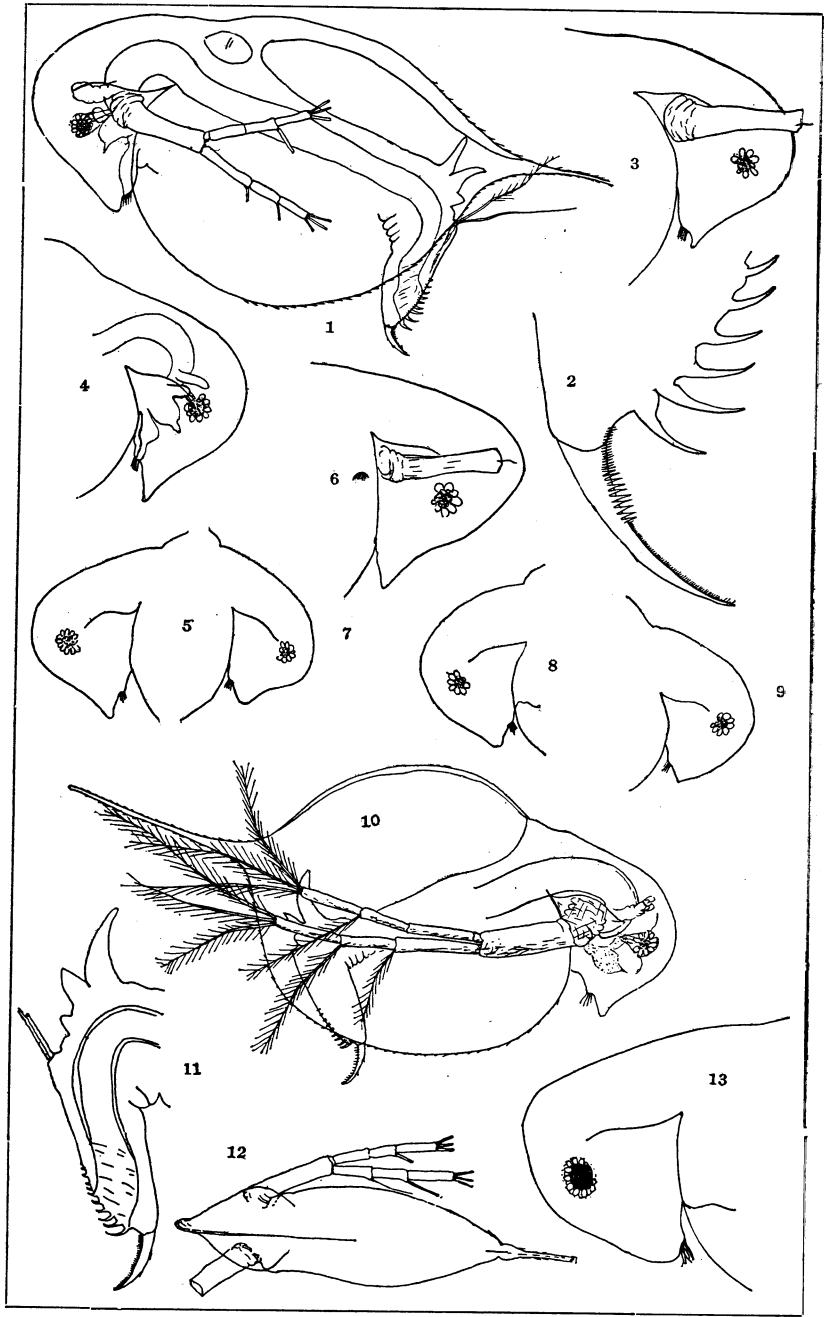




Birge.

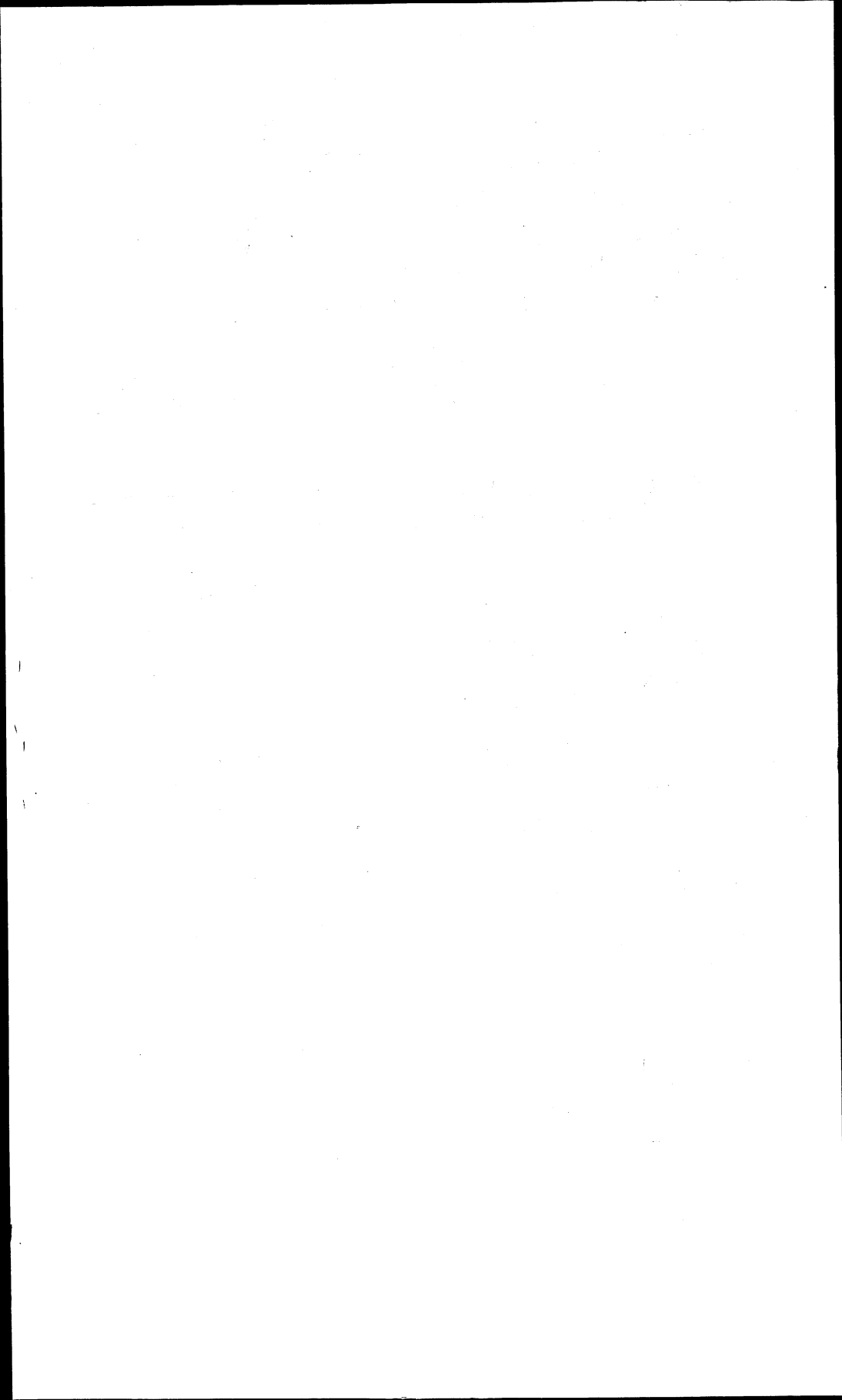
Cladocera.

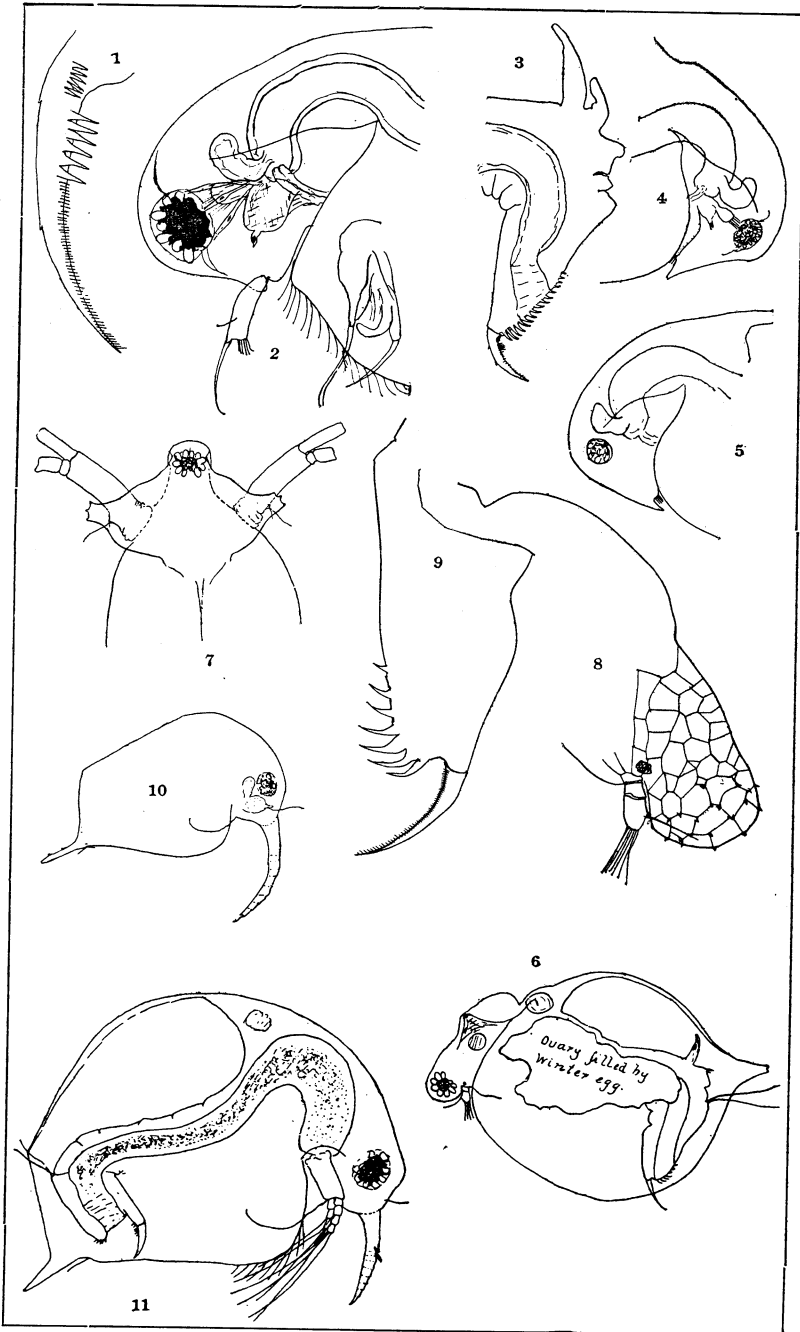




Birge.

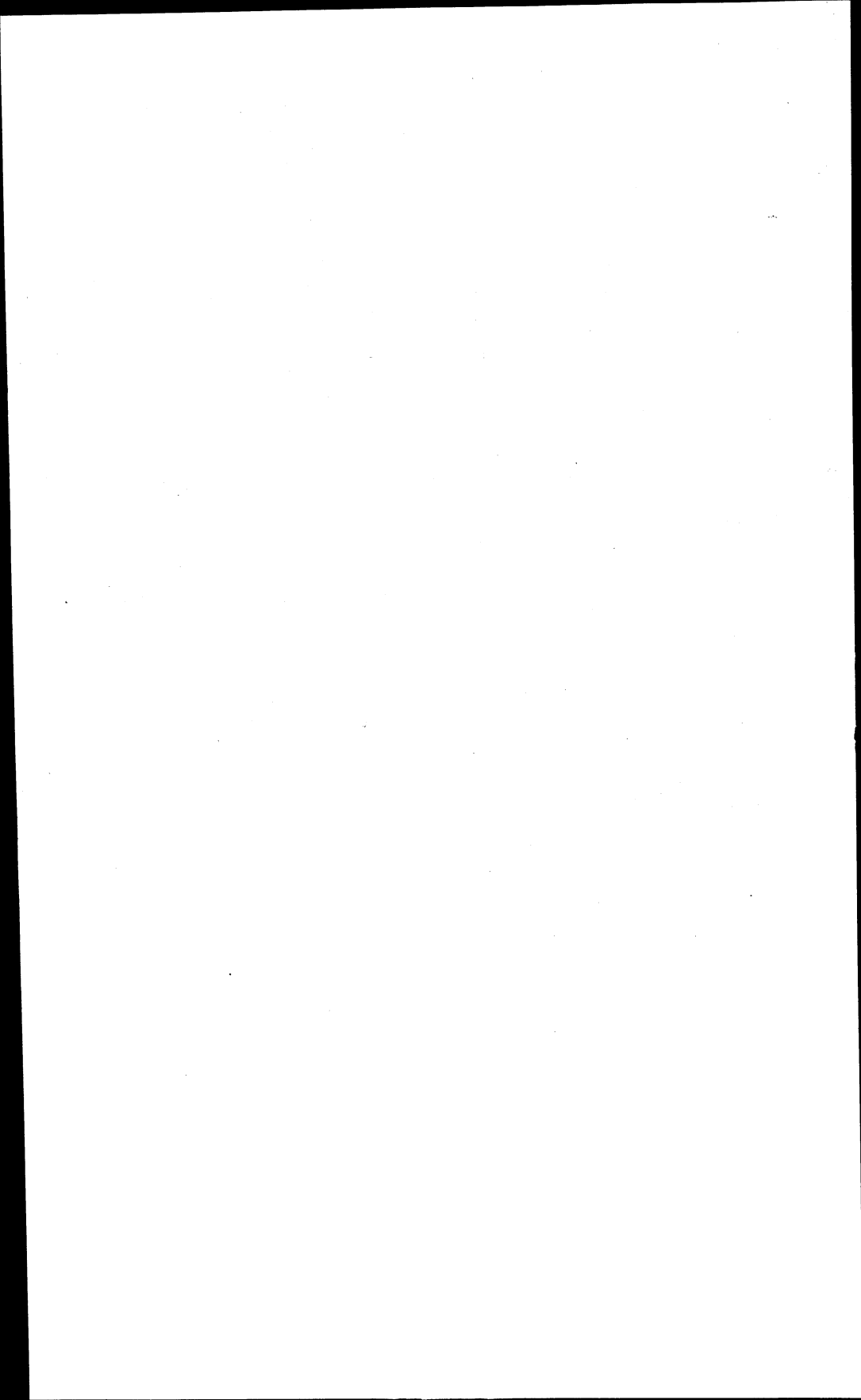
Cladocera.

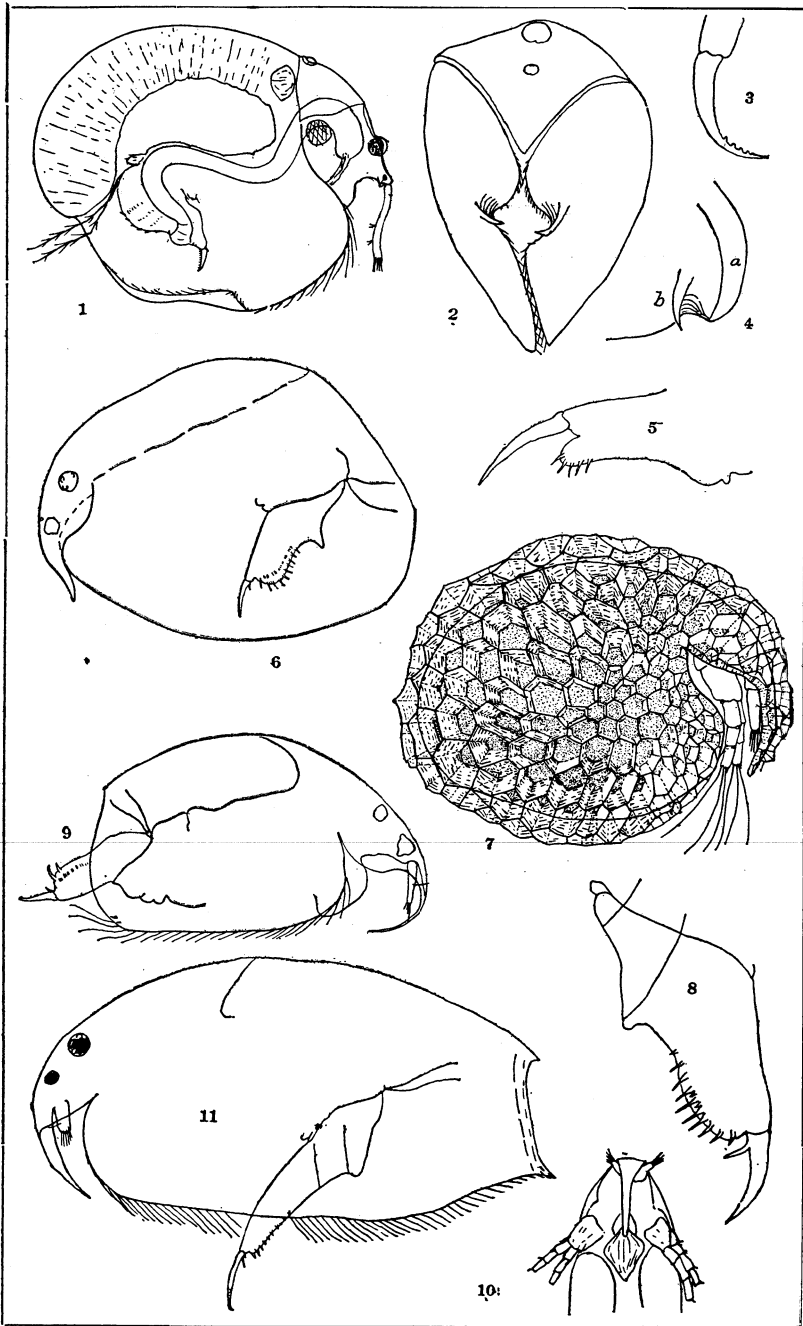




Birge.

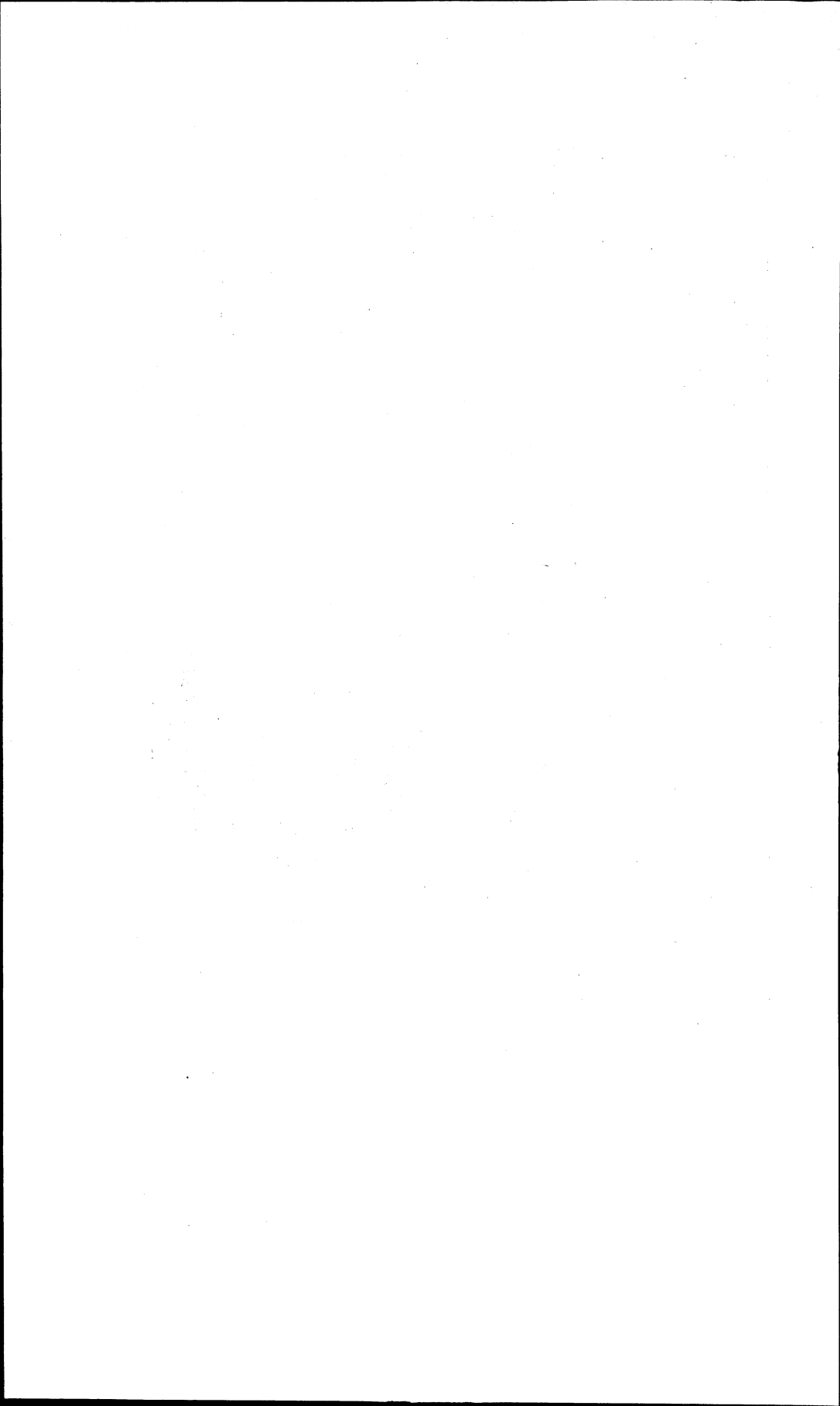
Cladocera.





Birge.

Cladocera.



THE STRUCTURE AND AFFINITIES OF BUNOPS SCUTIFRONS, BIRGE.

By HARRIET BELL MERRILL, M. S., Instructor in Biology, Milwaukee High School.

This paper describes a member of the family *Macrothricidæ* found by Professor E. A. Birge at Minocqua, Wis., in Lake Kawaquesaga, July, 1892. It was recognized by him as the type of a new genus, and is described in this volume (pp. 275-317) under the name of *Bunops scutifrons*. Numerous specimens, preserved in alcohol, were given to me with the request that I would study the anatomy as far as possible and determine the relationships of the genus to the other members of the family. The anatomy of the skeleton and appendages was especially desired, as Dr. E. Daday de Dees in his *Crustacea Cladocera Faunæ Hungaricæ* had described a closely allied species as belonging to the genus *Macrothrix*, under the name *M. serricaudata*. Herrick also had seen in Minnesota another member of the genus and described it as *Macrothrix pauper*. It was therefore necessary to study the appendages carefully with reference to the corresponding structures in *Macrothrix* and the other members of the family.

In July, 1893, a very few specimens were found at Madison, and some notes were made on the internal organs, but lack of time prevented a complete study of the internal anatomy.

DESCRIPTION.

Viewed laterally the general form of the body is round, (Pl. XIV, Fig. 1). The height and length are nearly equal, the length usually exceeding the height. The dorsal margins of the valves are coalesced to form a strongly and evenly arched keel or crest extending the entire length of the body. At the posterior end, the crest forms a marked rounded projection

where the dorsal joins the ventral edge of the valves. The general semicircular outline of the ventral margin is broken by a slight concavity at its most ventral part caused by the curling or infolding of the ventral edges of the valves. Viewed from below, (Pl. XIV, Figs. 2, 6), the posterior half of the ventral edge of the valves is seen to be sharply inflected to form a right or acute angle with the main part of the valves, causing the valves to gape widely at the anterior part, even when the posterior parts are tightly closed. The anterior ventral margin is edged by long, smooth, straggling, movable hairs. Just in front of the infolding is a space where they are short and feeble. Along the infolded part they are short and densely set, and cease altogether a short distance from the posterior end. At the anterior part of the ventral edge of the shell, the hairs are placed alternately in and out, but upon the bend, out only. On the infolded part they point inward. The infolding of the ventral edge sets the posterior hairs up a little, so that there is a space between them and the apparent edge of the valves as seen from the side. The valves are reticulated with hexagonal meshes in the anterior portion. Similar reticulations are seen on the head. The keel and posterior part of the valves are smooth.

HEAD.

Pl. XIV, Figs. 1, 4.

The head is small, triangular in general outline, and is very short antero-posteriorly. It is shorter and smaller in proportion to the size of the animal than in any other genus of the family. It is not depressed and the rostrum projects forward. The crest extends over the head about one-third of its length and then widens out into a triangular area, which is continued as a flattened rectangle to the end of the rostrum. This area is thus somewhat kite-shape or shield-like in outline. Its edge is formed by a strong ridge, whose lower part probably represents the continuation of the fornices. The general surface of this area is depressed and the sides of the head are compressed just behind the boundary line. This area I call the forehead. The even surface of the forehead is broken by a very pronounced, al-

most hemispherical projection over the eye. The ventral margin of the forehead is bilobed and continues vertically on each side as a small flap, covering the insertion of the antennules. The ventral margin of the head is deeply concave and passes into the large labrum. Just above the labrum is a projection for the attachment of the muscle of the labrum and a spine on each side. The labrum consists of two parts, the outer a broad and triangular projection, the inner smaller. The edge of the labral projection is smooth.

The fornices are moderately broad (Pl. XIV, Fig. 5.), covering the base of the antennæ. They extend to the anterior edge of the head, and disappear just before reaching the forehead, which they join at the point where the triangular passes into the rectangular portion. Below the fornix, the head becomes thin from side to side, being thinner than the breadth of the forehead, and very high ventro-dorsally.

GENERAL MEASUREMENTS OF THE ANIMAL.

Greatest height.....	0.875 mm.
Greatest length.....	1.06 mm.
Perpendicular length from haft-organ....	0.717 mm.
Forehead.....	0.105 mm.
Diameter of boss over eye.....	0.07 mm.
Projection of boss.....	0.027 mm.
Length of setæ on ventral edge.....	0.010 mm.
Triangular piece of labrum, length.....	0.122 mm.
Triangular piece of labrum, width.....	0.105 mm.
Diameter of eye.....	0.052 mm.

APPENDAGES OF THE HEAD.

(A.) ANTENNULES.

Pl. XIV, Figs. 4, 5.

The antennules are very long, almost as long as the branches of the antennæ, cylindrical, tapering slightly at the end. The antennule forms a gentle compound curve, greatest at the proximal end. It is much narrowed at the point of attachment.

It is sparsely covered with fine, short spines, arranged in transverse rows at the proximal end, but reduced to scattered bunches and single hairs at the opposite end. At the terminal end there is a circle of four or five small teeth, and from between these spring eight or ten delicate sense hairs of about uniform length. The tip of each sense hair is enlarged slightly to form a knob. There are two pairs of sense hairs on the outer side of the distal half of the antennule. The farther pair is situated about one-sixth the length of the antennule from the end; the other pair about the same distance from the first. There is no distinction between the basal and terminal parts of the hairs. They are curved, taper slightly, and are of about equal length. There is also on the proximal end very near the base, a single sense hair which is about as long as the terminal hairs. It is very stout at the base and tapers abruptly to a delicate hair. The basal is about half as long as the terminal part.

MEASUREMENTS OF ANTENNULE.

Length	0.402 mm.
Sense hairs additional	0.052 mm.
Breadth	0.019 mm.
Greatest breadth.....	0.024 mm.
Least breadth.....	0.014 mm.
Lateral sense hairs.....	0.021 mm.

(B.) ANTENNÆ.

Pl. XIV, Fig. 1.

Formula of setæ, $\frac{0-0-0-3}{1-1-3}$; of spines, $\frac{0-1-0-1}{0-0-0}$.

The antennæ are of medium length and slender. The basal joint is long and slender, projecting considerably beyond the head. It is ringed at the base, the rings extending less than half the entire length of the joint. Along the dorsal side there is a row of short, stiff bristles, running from the rings lengthwise to the end of the basal joint, and the tip has a few scattered

hairs. On the ventral side is a single larger sensory bristle. The usual delicate sense bristles are situated on a slight tubercle on the outer side about the middle. The exterior, distal, one is the longer. From the extremity between the two branches, there arises a very long, delicate, sensory spine. It is smooth and bi-articulate, and extends somewhat beyond the two proximal joints of the dorsal branch.

The two branches attached to the basal joint are of nearly equal length, slender and somewhat tapering. The dorsal branch is four-jointed, with setæ on the terminal joint only. The proximal joint is very short, about one-third the length of the other joints, which are nearly equal in length. It has no accessory spines, hairs or setæ. The next joint is three times as long, bears a delicate spine on the dorsal side, but has neither hairs nor setæ. The next joint is like the preceding but without the spine. The terminal joint is slightly longer than the two preceding it. It has one spine at the end, and three terminal setæ. These setæ are moderately long, as long or longer than the whole length of the antennæ. They are two-jointed, flexible and sparsely plumose.

The ventral branch of the antenna is three-jointed. The proximal joint is smooth, bearing one very long seta, so long that it reaches beyond the tips of the terminal setæ. There is a marked projection of the joint at the place where the seta is articulated to it, but there are no spines. The seta is stiff at the middle joint, but is so long and slender as to be very flexible. It is sometimes sparsely plumose and occasionally shows very fine spinules. The second joint of the branch is of about the same character as the proximal, but shorter. The seta is bi-articulate and plumose. The terminal joint bears three terminal setæ, with the characteristics already described for the dorsal branch.

The spines on both branches are very delicate, irregular and of little importance. There may be a fringe of hairs around each joint, but they are difficult to distinguish even with a high magnifying power, and appear much like the threads attaching infusoria or filamentous plants.

MEASUREMENTS OF ANTENNÆ.

Basal Joint.

Extreme length.....	0.402 mm.
Average width.....	0.061 mm.
Width at free end.....	0.052 mm.
Rings at base.....	0.175 mm.

Ventral Branch.

Basal joint, length.....	0.196 mm.
Basal joint, width.....	0.024 mm.
Basal seta, length.....	1.240 mm.
Second joint, length.....	0.054 mm.
Second joint seta, length.....	1.050 mm.
Terminal joint, length.....	0.070 mm.

Dorsal Branch.

Basal joint, length.....	0.026 mm.
Second joint, length.....	0.070 mm.
Second joint, length of spine.....	0.001 mm.
Second joint, width.....	0.022 mm.
Third joint, length.....	0.070 mm.
Terminal joint, length.....	0.087 mm.
Terminal joint, width.....	0.017 mm.
Terminal setæ, length.....	0.875 mm.

POST-ABDOMEN.

Pl. XV, Fig. 6.

The post-abdomen is large, triangular, broad above, but greatly flattened below. It is divided into two parts by a notch on the dorsal side just anterior to the anus. The anus, therefore, opens on an elevation at a short distance from the terminal claws. As in Cladocera generally the anus is an elongated slit. Here it lies between two folds of integument. The fold on each side is provided with three spines posteriorly, and is bordered by a fringe of setæ

anteriorly. Laterally it has several bunches of stiff hairs. The terminal claws are placed on a prolongation from the anal lobe, which is very like the "End-stueck" of *Moina* or *Ophryoxus*, but much smaller. This prolongation bears two small teeth on each side. The terminal claws are slender, sharply curved at the end and finely denticulate. The teeth are of uniform size and there is no secondary tooth at the base of the claws. Anterior to the anus, the post-abdomen widens out rapidly with a semicircular margin and bears five to seven marginal hooked teeth, and laterally, several rows of hairs extending from three or more of the teeth over about one-fourth the side of the post-abdomen. The abdominal setæ are situated on no special projection. They are long, slender, sparsely plumose and bi-articulate. The margin of the post-abdomen between the abdominal setæ and the anal spines is crenelated and bordered by short fine hairs. Anterior to the abdominal setæ is a prominent abdominal process, consisting of a rounded ridge bearing a number of stiff hairs. Anterior to this is another lower ridge bearing several long hairs. These ridges fit into a fold of carapace and close the brood cavity. The dorsal part of the body possesses what Sars calls "mammilliform processes" similar to those in *Macrothrix*.

MEASUREMENTS OF POST-ABDOMEN.

Sense hairs to notch.....	0.19 mm.
Notch to terminal claws.....	0.11 mm.
Length of terminal claws.....	0.06 mm.
Greatest width of post-abdomen.....	0.24 mm.
Length of abdominal setæ.....	0.28 mm.

LEGS.

The nomenclature followed is that of Lund.* He divides the leg into two parts, the stem and two branches. In all cases the stem is short and scarcely distinguishable as a separate part. In an ideal leg, the stem would bear four processes. These

* Bidrag til Cladocerernes Morphologi og Systematik, ved L. Lund; Naturhist. Tidsskrift. Vol. VII, pp. 130-174, Pls. V-IX, 1871.

are never all present on the same leg, however. On the inner side of the stem there is a vesicular process, the gill sac, which is always present. This gill sac is small in the *Macrothricidae* and is usually oval or kidney-shaped. In *Bosmina* and the *Lynceidae* it is drawn out into a long process.

Immediately above the gill sac there is in many Cladocera a delicate ciliated lobe or extension. It is found only in the more posterior legs. On the outer side is a process which ideally is flattened and rectangular, but usually becomes triangular in shape. It bears setæ and cilia, and is frequently coalesced with the inner branch of the stem. This is the maxillary process. It is sometimes absent in the first leg, but usually present in all the others. The "setæ terminales stipitis" lie below the maxillary process and consist of a stout ciliated seta on each side.

There are two branches attached to the distal end of the stem. The inner branch is lobed and forms the working part of the leg. The outer is membranous. In the anterior legs, the inner branch is most strongly developed. In the posterior ones the outer is the larger.

Bunops scutifrons has five broad leaf-like legs. They conform in general to the type of structure of the *Macrothricidae*, showing differences in detail from those of any other genus.

FIRST LEG.

Plate XV, Fig. 1.

As in all the family the first leg is very large and broad, with hooks and setæ capable of projecting beyond the edges of the valves. Starting from its point of attachment, it runs forward parallel with the labrum, and then bends down abruptly, forming a sort of knee. Above the bend there is a tuft of delicate bristles, and a little within the margin above the gill sac are two strong, posteriorly curved setæ. The gill sac (*g*) is the only process present upon the stem. The maxillary process seems to be entirely lacking. The distal portion of the leg consists of two branches, the ramus interior and the ramus exterior. The latter is represented only by a slight projection

below the knee, which lies not far above *i* in the figure. The interior ramus is very greatly developed and divides into two irregular branches. The posterior branch (*i*) is broad and plate-like, while the anterior (*i*) is narrower and somewhat conical. The anterior branch again divides into two, and the posterior into three parts, each bearing spines, hooks or both. The anterior lobe of the anterior branch of the interior ramus (*i*) bears one long bi-articulate seta ciliated along the anterior edge. It is by far the longest seta on the leg. The posterior lobe has two stout hooks of unequal size, and one seta which is smaller than the anterior one, but is also bi-articulate and ciliated. The main peculiarity of the leg is the presence of the large hook. (Plate XV, Fig. 1, *b*). In the possession of this large hook, *Bunops* differs from most other members of the family. The hook is smooth, very large, almost as long as the ciliated setæ on the same lobe, and is attached just under it. At its point of attachment it is narrow; it then widens suddenly to almost double its basal width and tapers gradually to a point. It is sharply curved posteriorly at the end. This hook of *B. scutifrons* is proportionately stronger than that of any other member of the family, although it is possessed by *Ophryoxus* and *Drepanothrix*. *Macrothrix*, to which genus a species of this genus was referred by Daday,* has only an ordinary seta in place of this hook. The hook connects itself with the mode of life of the animal, being used for holding to weeds. *Bunops* is much like *Ophryoxus* in its habits. It lives in shallow water among weeds, and swims from weed to weed, clinging to them with the hook of the first leg. It uses its feeble antennæ with a steady, forward, paddling motion, like that of *Ophryoxus*. While clinging to weeds with the hook of the first leg, it rakes in food with the second. The smaller hook is about half the diameter and length of the larger one, and probably serves the same purpose, in a less degree.

The posterior branch (*i*) of the interior ramus has setæ on four distinct parts. The two anterior lobes are the largest and have two rows of setæ, six in a distal row, three for each lobe,

* Daday, E. Crustacea Cladocera Faunæ Hungaricæ, p. 105.

and two in a proximal row, one in each lobe. The anterior seta of the inner row stands between the two anterior setæ of the distal row, and the posterior one, anterior to the three distal setæ of the second lobe. The third lobe has two setæ while two other setæ arise from the side of the leg directly. These setæ are ciliated on both sides, except the second three of the distal row, which have cilia on the anterior side only. The entire leg, particularly the anterior part, is covered with lines of cilia. The leg agrees in this respect with that of *Macrothrix*, but in the number and arrangement of setæ it agrees more nearly with *Acantholeberis*, while it is even more like *Ophryoxus* or even the Lynceid *Leydigia australis* described by Sars.*

SECOND LEG.

Pl. XV, Fig. 2.

The second leg is much shorter than the first, and somewhat broader. The exterior ramus (*e*) is here developed into a narrow delicate lobe, bearing one slender seta on its distal end, and covered with numerous fine hairs. The inner branch (*i*) shows indications of the same lobing as the first leg, but so much slighter, that it practically constitutes one rectangular plate. The setæ are arranged in two rows as in the first leg. The distal row consists of nine stout bi-articulate setæ. The two exterior ones are longer and more slender than the others, and have cilia on the posterior edge only. They resemble the two anterior setæ of the first leg. The seven following are graduated in length from first to last. The distal joint of the first six is set with delicate close-set plates, making a comb-like structure, instead of setæ, and the joint is curved. The proximal joints have very fine cilia. The seventh seta has cilia and no plates. It is much straighter than the others. The proximal row of setæ consists of three, borne in two small lobes. The anterior lobe bears two small, smooth setæ, while the posterior lobe has but one seta. The maxillary process is well

*Sars, G. O., On some Australian Cladocera raised from dried mud, *Christiania Videnskabs-Selskabs Forhandling*, 1885, pp. 39-41, Pl. VIII, Figs. 2-6.

developed. The triangular tip has three slight divisions. The dorsal part of the maxillary process has five bi-articulate, falciform, incurved setæ. The ventral side near the base is covered with fine bristles.

THIRD AND FOURTH LEGS.

Pl. XV, Figs. 3, 4.

As in all the family the outer ramus of these legs is well developed, thin and leaf-like. In the third leg * the exterior (*e*) is almost as well developed as the interior branch. It is broad, rectangular and very thin, bearing three very long ciliated setæ at the end, the middle one being the longest, and the two at the side, curving back. The interior ramus (*i*) is smaller than in the second leg, but of the same shape. It shows the same trace of anterior and posterior lobing that former legs show, and the same two rows of setæ, distal and proximal. The distal row consists of eight setæ. The basal joints are very stout as compared with the distal ones. The three anterior setæ are ciliated on one edge of the distal joint. The maxillary process is almost as in the second leg, but has dense hairs at the triangular tip, and four or five setæ at the side, shorter than in the second leg.

The exterior ramus of the fourth leg (*e*) is not nearly as well developed as in the third leg, and not as well as in the same leg of *Acantholeberis*. It has four ciliated setæ and is thin and delicate. The inner branch is as broad as in the third leg and shows traces of lobing. The distal setæ are better developed than the proximal. They are four in number, unguiform, bi-articulate, pectinately ciliated on one edge. The proximal edge has five setæ, each two-jointed. The basal joint of each narrows abruptly into a delicate seta, constituting the second joint.

The maxillary process has three accessory parts, the process called by Lund "the terminal seta of the stem," one large geniculate seta, and four setæ on the dorsal side as in the third leg.

* In the plate the third and fourth legs are shown on a scale twice as great as the others, so as to make plain the numerous details.

FIFTH LEG.

Pl. XV, Fig. 5.

The fifth leg consists of the exterior ramus and the maxillary process only. The outer ramus is well developed and has two setæ, the larger one curving around the gill-sac and the other straight. The maxillary process has three setæ. One is long, borne on a separate lobe, and there are two short setæ at the side. The setæ are all densely ciliated.

The legs of *Bunops* differ from those of the other genera of the *Macrothricidæ*, in that the four anterior legs all show traces of lobing of the inner branch, and that all four legs possess setæ arranged in distal and proximal rows.

INTERNAL ORGANS.

The specimens of *Bunops scutifrons* which I obtained from Minocqua were simply preserved in alcohol, and the internal organs were not in very good condition for study. In early July, 1893, a few specimens of the species were found at Madison, Wis., and a short study of the general internal structure was made.

The animal is hyaline and all of the internal organs can be seen very plainly.

The intestine is a simple tube, with no glands or convolutions. Its walls are rather thin, and its contents give it usually a yellow color, rendering it a very conspicuous object in contrast to the colorless organs along which it lies. The heart (Pl. XIV, Fig. 4.) has the usual form of a rounded sac, having the venous ostia placed as usual. The crest of the valves is so developed that the axis of the heart instead of lying parallel to that of the body, is at right angles to it, the anterior end of the heart being dorsal. A short arterial trunk is connected with it.

The blood is of a pale yellow color, and it seems devoid of corpuscles. This fact has already been noted by Weismann in *Lathonura rectirostris*. It is not improbable that the corpuscles are wanting in a large number of the Cladocera, but no exact observations on this subject have as yet been made.

The organs situated in the head are greatly crowded together, by reason of the lateral flattening of the head, and its very short antero-posterior axis. Intestine, brain, and eyes are closely pressed together. The general form and arrangement of these organs can be seen in Pl. XIV, Fig. 4. The eye is of moderate size, and shows about eight lenses, which do not project far from the pigment. Its muscles number, as usual, three on each side, and are very short. The optic ganglion is so close to the eye that the optic nerves are hardly visible. The brain is of usual size, pear-shaped as seen from the side, and has a stout projection extending to the macula nigra. This structure lies at the apex of the rostrum, is quadrangular in form as seen from the side, and is of ordinary size. A curious, pear-shaped little body, (Fig. 4, a.) very transparent, and apparently without definite structure, lies in the apex of the rostrum. It has the appearance of a large eye-lens, but does not seem to be related to the pigment spot, though it is attached to the nerve of the antennule. The antennular nerve develops the usual ganglion in the antennule, and calls for no special description.

The dilator muscles of the oesophagus are quite distinct, and easy to make out. They appear to be in two groups, of about four muscles each, on each side of the oesophagus. The muscles of each cluster converge, and are attached to the side of the head.

There is a large labral gland, as usual, but the greater part of the crest of the labrum is empty, showing a clear space. The elevator muscles of the labrum occupy the ordinary position.

The shell gland, on the whole, recalls the form of that organ in the *Lynceidæ*. It is long, narrow, and developed into a round loop at the ventral end.

The figure shows one of the mamilliform processes, of which there may be three or four. These are probably of use in furnishing nutriment to the developing young. They occur also in *Macrothrix*.

The ovaries call for no special remark. The summer eggs number 6-8, are of an elongated oval form, and have a bright green yolk.

A small cervical gland is present in both young and adult forms.

BIOLOGY.

As the animal was not kept in aquaria under observation, little can be said of its biology. It lives in shallow water, among *Utricularia*, *Miliefotium*, *Lemna* and similar plants. It swims with a feeble but steady motion, already compared to that of *Ophryoxus*. To this genus, indeed, its habits closely correspond.

The known range of the species is at present about 200 miles in a north and south direction, from Minocqua to Madison. It has not been found in the intermediate country. It is probably very local in its distribution. In a second visit made by Prof. Birge to Minocqua for the express purpose of obtaining more material of this species, it was found only at the particular spot where it was first discovered. Nor has it appeared in nearly forty bottles of material collected in similar localities in the same region.

In Madison, it was found in one end of a ditch draining a marsh. It has not been found elsewhere there, although very careful search was made in exactly similar ditches and pools near by.

The males of the species have not been found. It was hoped that they would appear at Madison, but the ditch rapidly dried up in late summer without showing the presence of males.

SPECIES OF THE GENUS BUNOPS.

The genus *Bunops* includes at present two species, *Bunops serricaudata*, Daday, and *Bunops scutifrons*, Birge. Daday describes his species under the name *Macrothrix serricaudata*.* According to Daday's description, and more particularly his drawing, the two species differ from each other in but few particulars. The crest is present in *B. serricaudata*, but is serrated from the posterior end for about one-third of its length. The ser-

*Daday, E., Crustacea Cladocera Faunæ Hungaricæ, p. 105, Pl. II, Figs. 47-48.

rations are large, of uniform size, and their points are directed posteriorly. In *B. scutifrons* the crest is smooth, although minute serrations are sometimes seen with a high magnifying power. These are not more than four or five, and the points are directed anteriorly. They are quite too minute to be shown on the scale of my figures. The position of the spines on the ventral margin of *B. serricaudata* as shown in Daday's figure, seem to indicate that the edges are infolded as in *B. scutifrons*. The head differs in shape. It is smaller, shorter and more concave ventrally. The drawing shows a slight curve over the eye, indicating that *B. serricaudata* possesses the convexity above the eye characteristic of *B. scutifrons*. The curve is not mentioned in the description. The depression between the head and thorax is deep. The post-abdomen is very like that of *B. scutifrons* in general outline. There is the same notch dividing it into two lobes, with the anus opening on the posterior lobe, the same crenelation on the pre-anal portion, and no elevation for the abdominal setæ. The post-abdomen of *B. scutifrons*, however, has more spines than has that of *B. serricaudata*; there is a decided prolongation of the post-abdomen between the anus and terminal claws, and the terminal claws are serrate and not smooth as in *B. serricaudata*. The abdominal setæ of *B. serricaudata* are much longer and bi-articulate, and there is only one ridge before them. The antennules are very similar in shape, length and position, but do not show the single basal sense-hair found in *B. scutifrons*. The antennæ are neither described nor drawn by Daday.

Herrick* described a form which he called *Macrothrix pauper*, which probably belongs to this genus, but the description differs from *B. scutifrons* in many particulars. The general shape differs greatly. The head projects so as to give an almost triangular outline to the animal, while *B. scutifrons* is nearly round. There is a sharp angle where the dorsal joins the ventral part of the valve, and the posterior margin is straight instead of concave. The post-abdomen is smaller, shows no trace of notch or spines and has a wholly different form. Herrick says; "There

* Geological Report of the State of Minnesota, 1884, pp. 76-71, Pl. C, Fig. 4.

seems to be some affinity between this species and *Bosmina*," but *Bunops* shows no such affinity. If Herrick's imperfectly described form belongs to this genus, it is very different from the species under consideration.

RELATIONS OF BUNOPS IN THE FAMILY MACROTHRICIDÆ.

The family *Macrothricidæ* is small, distinguished by many genera and few species, and the genera show many interesting cross affinities. There are nine genera, each containing one to five species; *Macrothrix*, five; *Drepanothrix*, one; *Lathonura*, one; *Ophryoxus*, one or two; *Acantholeberis*, one; *Grimaldina*, * one; *Guernella*, * one; *Ilyocryptus*, three European species and two from the southern hemisphere; *Bunops*, two. In marked contrast with this family with its large number of genera, each containing very few species, is that of the *Daphnidæ*, containing six or seven genera, of which the genus *Daphnia* alone comprises some forty or fifty described species. The family *Lynceidæ* has some twelve genera, and the genus *Alona* contains as many as thirty species; *Chydorus* nearly twenty species; with other genera equally as large. Both the *Daphnidæ* and *Lynceidæ* thus have shown a capacity for specific variation, far greater than the *Macrothricidæ*. The genus *Bosmina*, the sole representative of the family *Bosminidæ*, has at least twenty-five American and European species, a greater number than the nine genera of the *Macrothricidæ*. But while the *Macrothricidæ* are deficient in number of species, yet in genera, and in range of form and structure, they compare favorably with any of the larger families.

There is a curious parallelism of development in all of these three families, *Daphnidæ*, *Macrothricidæ* and *Lynceidæ*. In each, we find genera whose form is approximately spherical, and these genera are the smallest in size in the family. *Ceriodaphnia* among the *Daphnidæ*, *Streblocerus* in the *Macrothricidæ*, *Chydorus* and *Anchistropus* in the *Lynceidæ*, are respectively the smallest genera of those families; while the rotund *Pleuroxus nanus* is the smallest of the Cladocera. In each

* African genera described by J. Richard.

family, crested forms are found. These are *Daphnia*, especially *Hyalodaphnia*, in the *Daphniidæ*; *Acroperus* and *Camptocercus* in the *Lynceidæ* and *Bunops* in the *Macrothricidæ*. These genera too, are much compressed laterally. In all these families, there are genera with a post-anal projection of the post-abdomen, and genera without such projection. *Moina* among the *Daphniidæ* has such a projection conspicuously developed, and *Ophryoxus* and especially *Ilyocryptus* among the *Macrothricidæ*. In the *Lynceidæ*, such a projection is the rule, to which *Eurycercus* is the only exception. No order in the animal kingdom offers better illustrations of convergence of development, than does the Cladocera.

When we attempt to compare *Bunops* with other genera of the *Macrothricidæ*, we are at once struck with the multiplicity and complexity of the relationships of these genera. While it is clear that *Bunops* is one of the most specialized members of the family, its relationships to less developed genera are by no means simple, as will appear from a study of its several parts.

As has been already said, *Bunops* is the crested *Macrothricid*, corresponding to *Daphnia* or *Camptocercus* in the other main families of the Cladocera. One difference between these crested forms of different families must be noted. In *Daphniidæ* and *Lynceidæ*, the crest of the head is the most developed part of the keel; while in *Bunops*, the crest extends but a little way upon the head. Other genera of the *Macrothricidæ* are keeled or slightly crested, though to a much less degree than *Bunops*. *Drepanothrix*, whose general form most nearly approaches that of *Bunops*, has a well-marked crest. *Streblocerus*, rotund in general form, has a slight keel on the dorsal side. *Macrothrix latirostris* has a decided keel, while *M. rosea* is practically devoid of one. *Acantholeberis* and *Ophryoxus* are evenly rounded over the back, and are the most generalized of the family in general form.

Bunops, while of compressed form, is not so greatly flattened laterally as is *Daphnia*. Its shape as seen from behind has the form of an isosceles triangle, the base being formed by the inflected ventral part of the valves. This structure also marks the high specialization of *Bunops*. In *Ophryoxus*, which comes

nearest to *Bunops* in habit, the ventral margins of the valves approach in front, gape in the middle, and approach again behind, (Plate XIV, Fig. 7). This is true of *Macrothrix* and of most of the family. In *Bunops*, the infolding of the valves is a peculiar structure unlike anything in the other genera. The arrangement allows the animal to feed by the aid of its anterior appendages, and at the same time protects the hinder limbs, which are used for respiration, from the parasitic algæ, which so often load the legs of *Macrothrix*. In *Acantholeberis* an imperfect protection is given by the spines of the carapace, and these are so arranged in *Streblocerus* and *Drepanothrix* as to form a kind of grating over the opening of the valves. The mud-haunting *Ilyocryptus* protects its legs by completely enclosing them within the valves.

The structure of the forehead is one of the most interesting features of the genus. The flattened or even concave forehead, with the fornices continued as its kite-shaped edges, and the boss over the eye, are peculiar to the genus. It is interesting to see how this structure is related to and derived from the corresponding part in the other genera. In *Acantholeberis* and *Macrothrix latirostris*, the dorsum of the head is rounded and projects evenly out to the apex, where the antennules are inserted. In *Lathonura*, *Ophryoxus* and *M. rosea*, the even curve of the dorsum is altered. The posterior part continues the outline of the back, and the anterior part bends abruptly downward, so that its downward course is nearly at right angles to the posterior part. At the same time, the fornices are developed into strong ridges which extend to the rostrum, and project on each side. Thus the head (Pl. XIV, Fig. 7), as seen from above or below, presents three parts, the first of which is a median ridge rounded over from side to side and bent dorso-ventrally, which is obviously the dorsum of the head as seen in *Acantholeberis*. On each side of this ridge is a valley rising on each side into the sharp ridges of the fornices; behind the median ridge, and near the angle of the head, lies the eye.

In *Drepanothrix*, the crest, or rather the keel, is carried out in an even curve to the apex of the rostrum. The head is accordingly greatly compressed, the antennules are inserted

close together, and the fornices do not extend to the rostrum. This head is evidently derived from a form like that of *Acantholeberis*, which has been flattened into a crest. In *Bunops*, the head seems to have been derived from a form like that of *Ophryoxus*. Its dorsum is not evenly rounded, but bends abruptly ventrally at a point near that where the fornices meet the dorsal edge. The crest is not carried out to the rostrum, but the forehead is flattened, even made concave. It is bounded by a stiffened edge which can hardly be anything except the fornix, although it has not the form characteristic of the fornix in the other genera. Above the eye rises a hemispherical elevation of the cuticle, which is evidently a portion of the median frontal ridge of *Ophryoxus*, retained to give the eye a better field of vision. Thus the relationship of *Drepanothrix* and *Bunops* is not particularly close, although at first glance such a relationship seems probable. It is probable that the former genus is related rather to *Acantholeberis*, while *Bunops* looks more toward *Ophryoxus*. The crest or keel seems to be an independent development in each genus.

The post-abdomen shows two types in the *Macrothricidae*, that with both post- and pre-anal portions, and that whose pre-anal part only is developed.

POST-ABDOMEN.	{	Possessing post-anal part.	{	<i>Guernella</i> .*
				<i>Grimaldina</i> .
				<i>Bunops</i> .
				<i>Ophryoxus</i> .
				<i>Ilyocryptus</i> .
		Anus terminal.....	{	<i>Drepanothrix</i> .
				<i>Lathonura</i> .
				<i>Streblocerus</i> .
				<i>Acantholeberis</i> .
				<i>Macrothrix</i> .

Of the three American genera possessing a post-anal projection of the post-abdomen, *Bunops* has the smallest and *Ilyocryptus* the largest. *Streblocerus*, whose post-abdomen is most like that of *Bunops* in general form, does not possess this pro-

* Cladoceres nouveaux du Congo: J. Richard. Extract des Memoires de la Societe Zoologique de France pour l'annee 1892, pp. 1-10, Figs. 1-6.

longation. In both these genera the posterior (dorsal) part of the post-abdomen is enlarged into a semicircular structure, which is flattened to a sharp edge and toothed. This form is widely different from that shown by *Drepanothrix*, *Acantholeberis* and *Macrothrix*, while that of *Lathonura* is wholly peculiar to itself.

APPENDAGES.—ANTENNULES.

The antennules of the *Macrothricidæ* show three characteristic forms:

ANTENNULES. {	Flattened and expanded at tip.....	{	<i>M. laticornis.</i> <i>Drepanothrix.</i> <i>Acantholeberis.</i>
	Flattened and twisted....		<i>Streblocerus.</i>
	Cylindrical.....	{	<i>Ilyocryptus.</i> <i>Lathonura.</i> <i>M. rosea.</i> <i>Ophryoxus.</i> <i>Grimaldina.</i> <i>Guernella.</i> <i>Bunops.</i>

Lateral sense-hairs are present as follows:

Lateral sense-hairs. {	None in female. {	{	<i>Ilyocryptus, Drepanothrix.</i>
	Proximal only. {	{	<i>Ophryoxus.</i> <i>Macrothrix.</i> <i>Acantholeberis.</i>
	Distal only.... {		<i>Streblocerus.</i>
	Both.. {	{	1 proximal and 1 distal... { <i>Lathonura.</i> 1 proximal and 2 distal... { <i>Grimaldina.</i> <i>Guernella.</i> <i>Bunops.</i>

The antennules of *Bunops* are closest in general form to those of *Lathonura*, but are longer and more slender, and have two pairs of distal sense-hairs, while *Lathonura* has only one pair. In *Grimaldina* and *Guernella* the distal sense-hairs are

single and much nearer the proximal sense-hair, than in *Bunops*. In *Guernella*, the antennules are short and broad, almost barrel-shaped, and covered with spines. Those of *Grimaldina* are long, and the genus resembles *Bunops* in head, general form, and post-abdomen.

ANTENNÆ.

The setæ of the ventral branch of the antennæ vary in number. There are three sets. Those of the dorsal branch are constant in number.

Setæ of Antennæ	$\left\{ \begin{array}{l} 3-0-0-0 \\ \hline 3-1-1 \end{array} \dots\dots\dots \right.$	$\left\{ \begin{array}{l} \textit{Drepanothrix.} \\ \textit{Ilyocryptus.} \\ \textit{Acantholeberis.} \\ \textit{Ophryoxus.} \\ \textit{Bunops.} \end{array} \right.$		
			$\left\{ \begin{array}{l} 3-1-0-0 \\ \hline 3-1-1 \end{array} \dots\dots\dots \right.$	$\left\{ \begin{array}{l} \textit{Streblocerus.} \\ \textit{Macrothrix.} \\ \textit{Grimaldina.} \end{array} \right.$
Character of proximal seta of ventral branch.	$\left\{ \begin{array}{l} \textit{Seta large and stiff.} \\ \textit{Joint anchylosed, but} \\ \textit{joint slender.} \dots\dots \end{array} \right.$	$\left\{ \begin{array}{l} \textit{Macrothrix.} \\ \textit{Drepanothrix.} \\ \textit{Grimaldina.} \end{array} \right.$		
			$\left\{ \begin{array}{l} \textit{Bunops.} \\ \textit{Ophryoxus.} \end{array} \right.$	
		$\left\{ \begin{array}{l} \textit{Seta jointed and} \\ \textit{flexible.} \dots\dots\dots \end{array} \right.$		$\left\{ \begin{array}{l} \textit{Ilyocryptus.} \\ \textit{Lathonura.} \\ \textit{Guernella.} \end{array} \right.$

In number and character of the setæ *Bunops* is most like *Ophryoxus*.

The enlargement and stiffening of the basal seta of the ventral ramus of the antennæ is a wide-spread character of the family. Correlated with the development of this structure goes a loss of the plumose character of the seta, and a development of short spinules or a sparse covering of hairs. In these or-

gans *Lathonura* has the most primitive form. All of the setæ are short, plumose, jointed and similar in character. *Ophryoxus* and *Bunops* come next with very similar antennæ, having a stiff but weak basal seta, practically free from spinules. *Macrothrix*, *Acantholeberis* and *Streblocerus* show a gradual enlargement of this seta, until in *Drepanothrix* it becomes extraordinarily heavy and sabre-like.

There are two prominent modes of swimming in this family. *Lathonura*, *Macrothrix*, *Acantholeberis* and *Streblocerus* move by sudden jerks with intervals of rest. *Ophryoxus* and *Bunops* have a steady paddling motion of the antennæ, giving a motion quite different from the jerks of *Lathonura*. This habit is carried to the extreme in *Ilyocryptus*, which makes the most patient and persistent efforts to move when held down in a live-box. *Drepanothrix* swims as little as may be, but scrambles about on the bottom while practically resting its heavy seta on the vegetable debris over which it scrambles. It does not seem to swim as freely as *Ilyocryptus*.

LEGS.

We find three types of *Macrothricidæ* in respect to the number of legs. *Lathonura* and *Grimaldina* have four pairs; *Guernella*, *Macrothrix*, *Streblocerus*, *Drepanothrix* and *Bunops* have five pairs, while *Ophryoxus*, *Acantholeberis*, and *Ilyocryptus* have six.

In the comparative study of the legs of *Bunops*, I have used Lund's paper for the genera *Bosmina*, *Lathonura*, *Macrothrix*, *Ilyocryptus* and *Acantholeberis*, and my own dissections and unpublished drawings of Prof. Birge, for the genera *Ophryoxus* and *Drepanothrix*.

The most striking peculiarity of the legs is the possession of the hooks on the first foot. In this, *Bunops* agrees most closely with *Ophryoxus*. That genus also has the first foot armed with two strong hooks of unequal size on the second division of the leg. *Drepanothrix* has one such hook, but much smaller and weaker. In that genus, however, the branchial sac of the first foot is much elongated and closely resembles the corres-

ponding structure of the *Lynceidae*. In *Bunops* and *Ophryoxus*, the gill sac is small and rounded. The resemblance to the other genera is not particularly close. *Macrothrix* comes as near to it as any other genus. *Ilyocryptus*, whose legs are quite different from those of the other *Macrothricidae*, is furthest removed from *Bunops*. *Bosmina* shows no special relation to *Bunops* in this or any other appendage.

It would be wearisome and unprofitable to compare all the appendages in regard to number and character of hairs and spines, and no attempt is made to carry out such a minute comparison, the general resemblances only being noted.

The second pair of legs is much alike in all the *Macrothricidae*. The chief difference, other than those of proportion, etc., concerns the development of the inner branch and the structure of the peculiar comb like the spines of the distal setæ.

The outer branch of the second leg of *Bunops* seems slightly developed in comparison with that of the other genera. In the *Macrothricidae*, the outer branch is very small in comparison with the *Daphnidae*, and *Bunops* seems to be one of the extreme types of the family in this respect. The comb-like structure of the setæ, possessed by *Bunops*, is shared by all other members of the family except *Ilyocryptus*. Of the other genera *Acantholeberis* is least specialized in this regard.

In the third and fourth legs, there is a great difference in the development of the outer branch. This is enormously expanded in *Ilyocryptus*, *Acantholeberis* and *Ophryoxus*, and much less so in the remaining genera. In *Bunops*, these parts are rather less developed than is the case in *Macrothrix*. It would seem as if the infolding of the ventral edge of the carapace reduced the space and caused a smaller expansion of the legs. In number and arrangement of setæ of the inner branch, *Bunops* agrees most closely with *Acantholeberis*, although possessing minor peculiarities of its own.

The fifth leg shows no special resemblance to that of any other genus.

When we come to the results of this comparison, it appears that *Bunops* approaches no one of the other genera of *Macrothricidae* closely enough to be regarded as a very near ally. In

antennules, it most closely resembles *Lathonura*: in antennæ *Ophryoxus*; in post-abdomen, *Streblocerus*; in general form *Drepanothrix*; and so on.

On the other hand, the two species united under this name show so many and so great peculiarities of structure, as to be entitled to rank as a separate genus of the family *Macrothricidæ*.

EXPLANATION OF PLATES.

PLATE XIV.

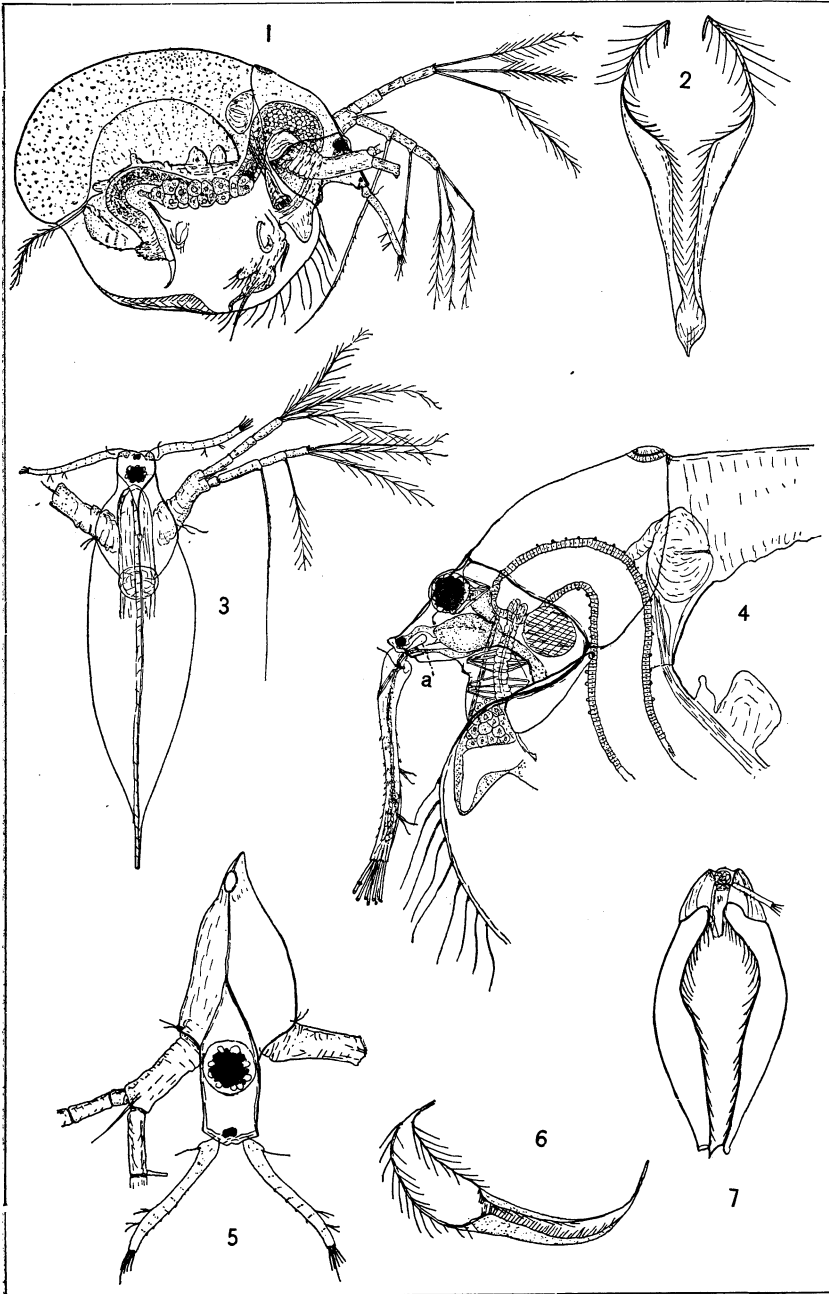
Bunops scutifrons, Birge.

- Fig. 1. Female. × 65. Rather small specimen.
 2. Valves from below. × 65.
 3. Animal from above. × 65.
 4. Head. × 100. *a*, lens-like body.
 5. Young female from front. × 100.
 6. Valves seen obliquely from below. × 65.
 7. *Ophryoxus gracilis*, Sars. Female from below. × 65.

PLATE XV.

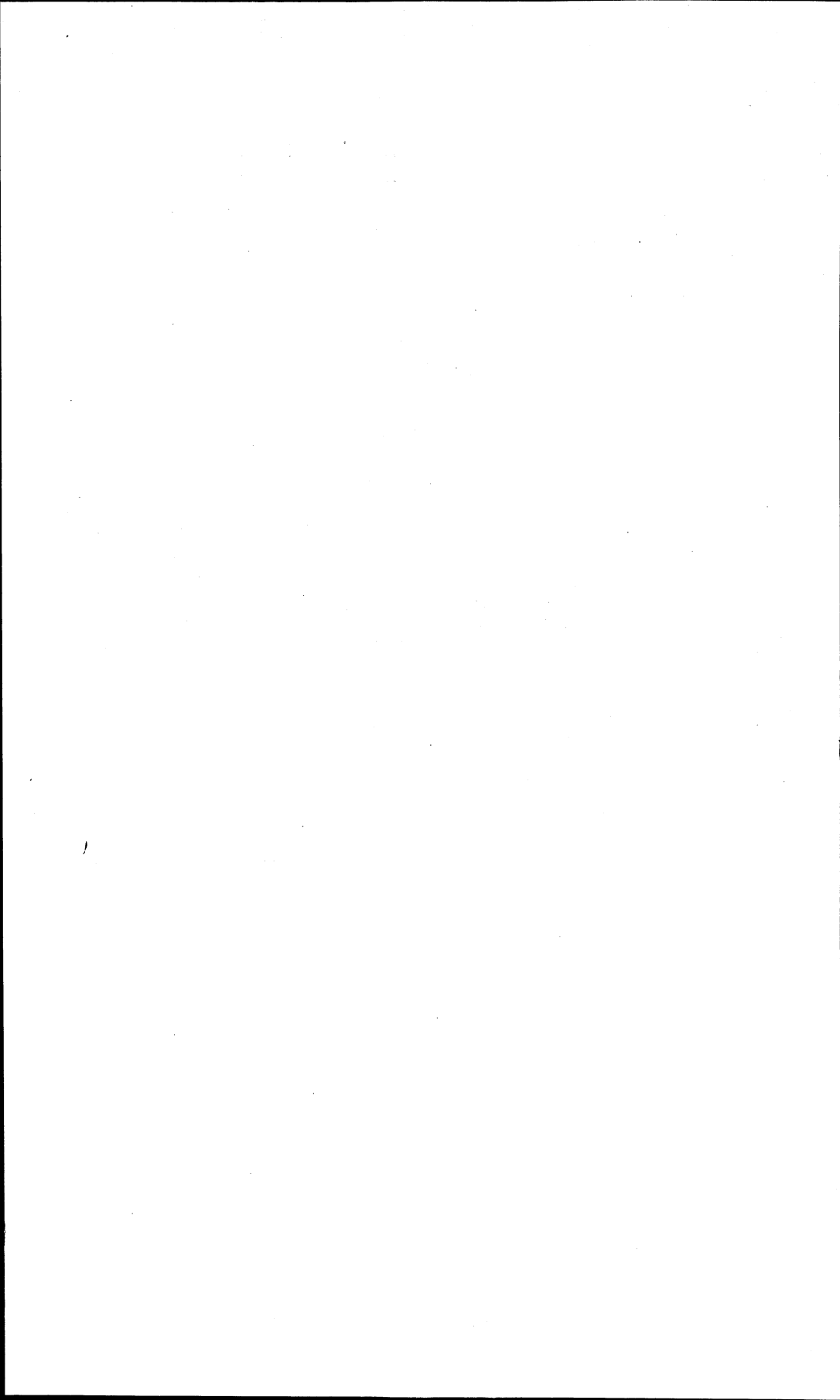
Bunops scutifrons.

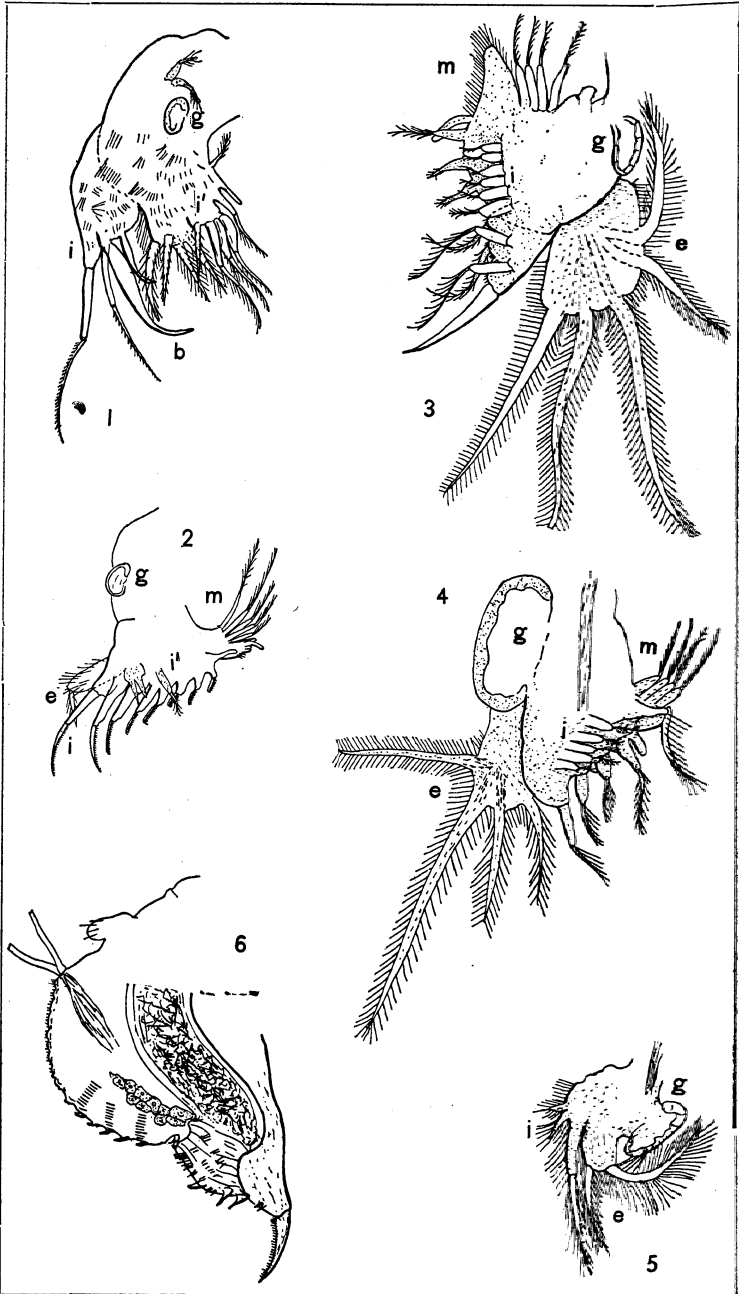
- Fig. 1. First leg. × 175.
 2. Second leg. × 175.
 3. Third leg. × 350.
 4. Fourth leg. × 350.
 5. Fifth leg. × 175.
e, exterior ramus; *i*, interior ramus; *i'*, inner division of interior ramus; *g*, gill sac; *m*, maxillary process; *b*, hook of first leg. In the fifth leg *i* denotes the maxillary process of the interior ramus. In the first leg the exterior ramus is represented by the slight projection not far above *i*.
 6. Post-abdomen. × 175.



Merrill.

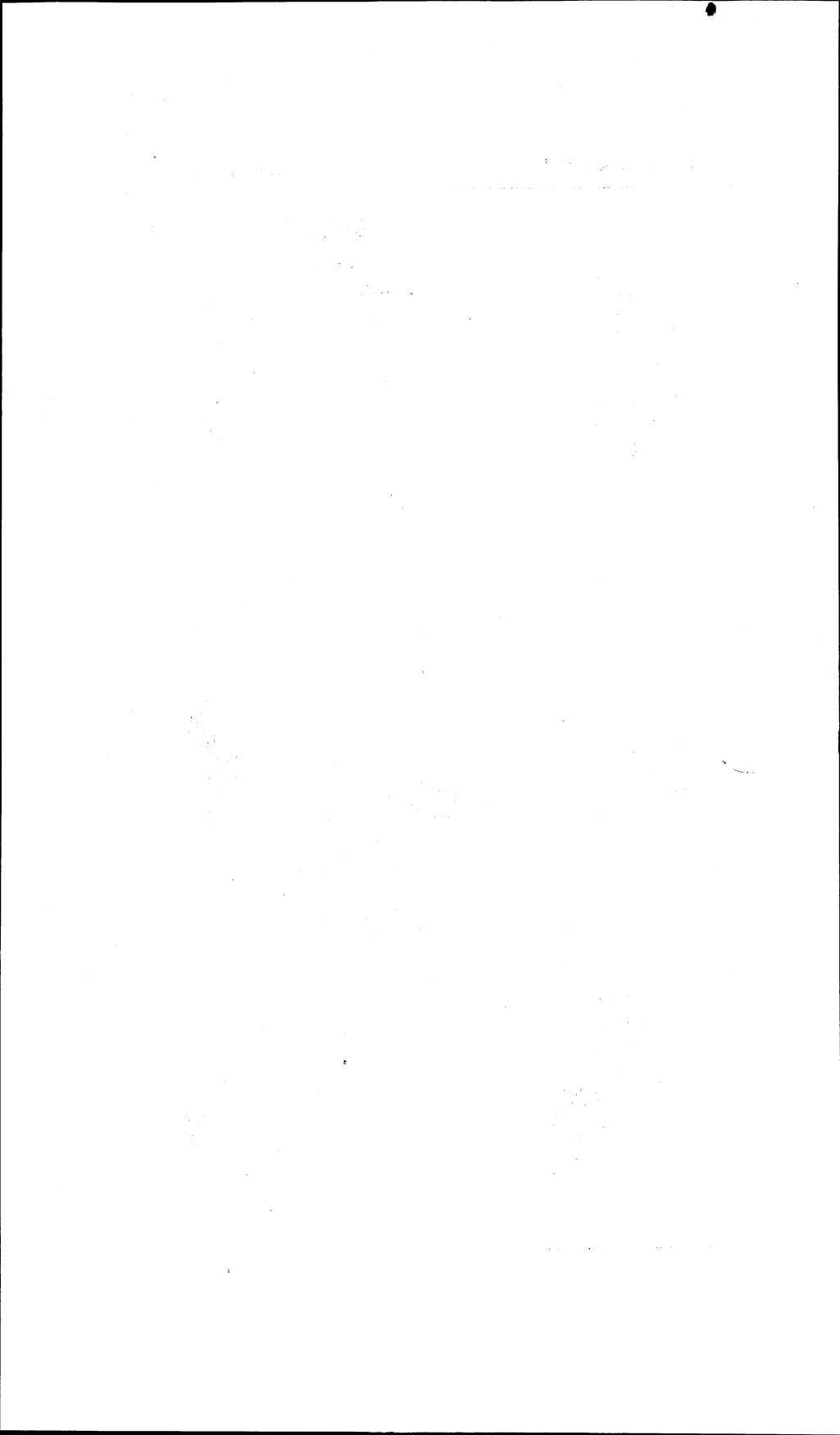
Bunops.





Merrill.

Bunops.



PROCEEDINGS.

REPORT OF THE SECRETARY.

MINUTES OF THE FIELD MEETING OF 1892.

Held at Ripon and Green Lake, June 2d and 3d.

On Thursday evening, June 2d, at 8 o'clock, the members assembled in Ripon College Chapel. After a brief word of welcome from Rev. Rufus C. Flagg, President of Ripon College, Professor C. R. Barnes delivered an address on "Asa Gray," which was listened to with much interest.

On Friday morning a session of the Academy was held in the biological lecture room of the college. In the temporary absence of the presiding officer, Vice-President A. H. Tolman, Mr. Reuben G. Thwaites was called to the chair. In view of the fact that the minutes of the last meeting had been printed in volume VIII of the Transactions, their reading at this time was dispensed with. The Secretary read a letter from Professor F. B. Power, Vice-President of the Department of Letters, resigning his office because of removal to Passaic, N. J. On motion of Professor Barnes, the resignation was accepted. It was then moved that the name of Professor Power be placed on the list of corresponding members of the Academy. Carried. This action made it necessary to elect a vice-president to succeed Professor Power. Professor J. J. Blaisdell of Beloit was nominated for this office, and was unanimously elected. The *pro tempore* presiding officer nominated Professors Marsh, Hillyer and Chandler a committee on new members, and instructed them to report at the evening session.

The librarian then reported the success of the plan of the library committee to increase the efficiency of the library, by

arranging and cataloging the books, and by adding to the list of exchanges. The names of some fifty new exchanges were read.

The librarian then recommended to the Academy that the books now unbound in the library be bound as soon as practicable. It was moved that the library committee be authorized to expend money in binding the books. Carried. The librarian then outlined a plan of distribution of books so that members non-resident in Madison might have some of the benefits of the library. The library committee was requested to arrange the details of this plan and report later.

Professor Hillyer moved a vote of thanks to the secretary and librarian for the efficient manner in which he had improved the library. The chairman desired to include in the motion the careful editing of volume VIII of the Transactions. After remarks by Dr. Loomis the motion was unanimously carried. The secretary was given authority to allow as much as ten dollars for the illustrations of a paper when the contribution was of sufficient value to warrant it. A larger amount than this might be allowed by the committee on publication.

Vice-President Tolman then took the chair, and the scientific program was begun by the reading of the following papers:

On the Flora of Madison and Vicinity, a Preliminary Paper on the Flora of Dane County, Wisconsin, by R. H. True and L. S. Cheney.

This paper was read by Mr. Cheney and was discussed by Mrs. C. T. Tracy, Messrs. Chandler, Thwaites, Barnes and the author present.

The Effect of Temperature Changes on Magnets, a Preliminary Notice, by H. B. Loomis.

This paper was discussed by Professors Chandler, Tolman and Barnes.

The session then adjourned till evening.

Despite the continuous rainy weather, thirteen took the train for Dartford at 11:20 A. M., and arriving there, omnibuses car-

ried them to the Sherwood Forest Hotel on Green Lake. The afternoon was given up to an excursion by steamboat around the lake, the rainy weather having but little apparent effect upon the spirits of the party.

At 7:45 P. M., the members of the Academy reassembled in the large reception room of the Sherwood Forest Hotel, Vice-President Tolman occupying the chair.

The chairman of the committee on nominations of new members, Professor Marsh, nominated in behalf of the committee the following persons, who were thereupon elected:

Rev. Rufus C. Flagg, Ripon.	A. H. Sanford,	Madison
Mrs. C. T. Tracy,	"	G. W. Moorehouse, "
Rev. Edward H. Merrill, "	L. S. Cheney,	"
Miss S. E. Cushman, "	R. H. True,	"
Rev. H. S. Richardson, "	A. H. Hollister,	"
Prof. N. S. Fuller, "	A. H. Garrett,	"
Rev. E. G. Updike, Madison.	James R. Stuart,	"
Rev. C. E. Hall, "	Prof. W. G. Sired,	"
Rev. H. C. McDougal, "	Prof. F. A. Parker,	"
Louis Kahlenberg, "		

An interesting address was then delivered by Mr. Reuben G. Thwaites, on "Village Life in Old England."

The following papers on the scientific program of the meeting were then read:

On Variable Stars, by S. D. Townley.

This paper was read by title.

Electrolysis of Organic Compounds, by H. W. Hillyer.

This paper was discussed by Professors Loomis, Barnes and the author.

English Surnames, by A. H. Tolman.

This interesting paper was discussed at length by a number of members.

Notes on a Trip to the Lipari Islands during the Late Eruption of Volcano, by Wm. H. Hobbs.

This paper closed the literary program.

Professor Barnes stated that the American Association for the Advancement of Science was looking towards Madison as a place in which to hold its annual meeting of 1893. He moved that the council be authorized to extend a most cordial invitation to the Association to meet in Madison. Carried.*

A vote of thanks was then given to Professors Marsh and Tolman, the committee on arrangements for the meeting, for the trouble they had taken to make the meeting a success.

The weather continuing to be unpromising, the trip planned for Saturday was abandoned, and the meeting adjourned *sine die*.

WM. H. HOBBS,

Secretary.

MINUTES OF THE TWENTY-THIRD ANNUAL MEETING,

Held at Madison, December 29th and 30th, 1892.

SESSIONS OF THURSDAY, DECEMBER 29.

The meeting was called to order in the rooms of the Academy at the Capitol by the president, Professor George W. Peckham, of Milwaukee. The president introduced President Charles Kendall Adams, of the University of Wisconsin, who delivered a short address of welcome. This was followed by the reading of the minutes of the Ripon meeting. The secretary then announced that the Academy had lost by death during the year just ended, the following members of the Academy:

Dr. A. L. Chapin, ex-president of Beloit College. A life member and past president of the Academy.

Dr. P. R. Hoy, of Racine. An active member and past president of the Academy.

Dr. J. S. Newberry, Columbia College, New York. A corresponding member of the Academy.

Hon. Edward D. Holton, of Milwaukee. An active member.

Remarks were then made by Dr. J. D. Butler, eulogizing Dr. Hoy. Remarks of a like nature having reference to Dr. Chapin,

*This invitation was extended to the association at the Rochester meeting in 1892.—*Sec.*

which were to have been made at this time by Professor Blaisdell of Beloit, were postponed, on account of his absence, till Friday.

The secretary then announced the following removals from the state:

Ex-President T. C. Chamberlain, to the University of Chicago, Chicago.

Dr. C. F. Hodge, to Clark University, Worcester.

Professor L. M. Hoskins, to the Leland Stanford, Jr., University, Palo Alto, Cal.

Mr. Frank Leverett, U. S. Geol. Survey, to Denmark, Iowa.

Mr. George E. Luther, to Grand Rapids, Mich.

Professor F. B. Power, to Passaic, N. J.

Professor R. D. Salisbury, to the University of Chicago, Chicago.

Mr. S. D. Townley, to the Lick Observatory, Mt. Hamilton, Cal.

These removals included two members of the council, Professors Power and Salisbury. A successor to Professor Power was elected at the Ripon meeting. A successor to Professor Salisbury was to be chosen at this meeting.

The secretary then offered his resignation of the curatorship of the cabinet, on account of his duties as secretary and librarian. The resignation was accepted.

The secretary then announced the favorable interpretation put by Secretary of State Cunningham upon the law regarding the printing of the Transactions, so that the cost of illustrations should be borne by the state.

The president then appointed Professors Barnes, Eckels and Butler a committee to nominate, first, a vice-president of the department of letters to succeed Professor Salisbury, and, second, a custodian to succeed the secretary.

The treasurer's report was then read. (This report is printed immediately following these minutes.) The president appointed Professors Birge and Haskins and General Delaplaine a committee to audit the treasurer's account, and to nominate new members.

The library committee then made a report urging that the state legislature be memorialized at its next session, for the

construction of a building for the accommodation of the libraries of the State Historical Society and the Academy, and recommending that the library of the University of Wisconsin be accommodated in the same building. (This report is printed in these proceedings immediately following the treasurer's report.) The report was unanimously adopted, and the Council of the Academy was made a committee to co-operate with the secretary of the State Historical Society to bring this matter before the legislature.

The treasurer then offered the following resolution, which was adopted:

Resolved, That the secretary and treasurer be instructed to strike from the list of active members of the Academy, the names of all who are in arrears in the payment of their annual dues, except in such cases as they know of reasons why, in their judgment, it is advisable to retain them for a while longer.

The following communication was then read:

MADISON, WIS., Dec. 23, 1892.

Wisconsin Academy of Sciences, Etc.

SIRS:—It is doubtless known to you that at the disposal of the fossils collected by the Wisconsin Geological Survey, two distinct collections were given to the Wisconsin Academy. These were, first, a collection of type specimens, from which the descriptions of new species published in the reports of that survey were prepared; and, second, a collection of the characteristic and common old species then known. The second collection was one of the twelve equal divisions into which the material other than types were separated, the other eleven being given to the principal educational institutions of the state, including the State University. The value of the first of these collections is purely scientific, and was rightly placed in charge of the Academy for safe keeping and for reference. The second collection has chiefly an educational value, as is illustrated by the use to which the other similar collections was put. It is well known that the State University lost its entire collection of Wisconsin fossils a few years since by the fire which destroyed Science Hall.

In view of these facts, and further, since both the Academy's collections have been placed in the University Museum for safe keeping, it would seem to be a fitting act for the Academy to donate to the University its educational collection, which will replace the one which the University lost by fire. I make this suggestion because I happen to be familiar with the facts, the collections of the State Geological Survey having passed through my hands in their distribution in 1879.

Respectfully,

IRA M. BUELL.

On motion of Professor Birge the Academy voted that the custodian be allowed to distribute the general collection of fossils with the collections of the University of Wisconsin, but so labelled as to indicate that they are the property of the Academy. The collection of type specimens is to be kept separate from the others, and not to be included in the general university collection.

The secretary then called the attention of the Academy to the fact that the list of corresponding members doubtless contains many errors, and that while the constitution calls for both honorary and corresponding members, they are not so classed in the proceedings. Attention was also called by both the secretary and Professor Birge to a number of clauses in the constitution of the Academy, which have lost their force, and it was moved by the latter that the president and secretary be constituted a committee with power to add to their number, to revise the list of corresponding members, and to prepare a revised draft of the constitution for adoption at a future meeting. Carried.

The advisability of holding a field meeting in the summer of 1893 was discussed, and the matter left in the hands of the council.*

The following papers of the program were then read:

Interpretations of the Ordinance of 1787, by Albert H. Sanford.

Elements Composing the Population of Wisconsin, by H. J. Desmond, Milwaukee.

Force, by Simeon Mills, Madison.

Road Building, by John Nader, Madison.

The Transmission of Power by Compressed Air, by C. H. Hile, Madison.

The meeting then adjourned till 2:30 P. M.

*The council decided not to call a meeting, owing to the meeting of the American Association for the Advancement of Science, which was to be held in Madison in August, 1893.—*Sec.*

The Academy reconvened at 2:30 P. M., when the following papers were read:

On the Geology of the Waterloo Quartzite Area, by I. M. Buell, Beloit.

Notes on Early Lead Mining in Wisconsin, by R. G. Thwaites, Madison.

The Progress of Geological Investigations and Surveys of the State of Wisconsin, Particularly of the Lead Region—An Historical Review and Bibliography. (Read by abstract.)

Notes on the Structure of the Ore Deposits of Southwestern Wisconsin, by W. P. Blake, Shullsburg.

Volcanite, a New Type of Andesitic Lava, by Wm. H. Hobbs and Louis Kahlenberg, Madison.

The Food of Green Plants, by C. R. Barnes, Madison.

The Academy then adjourned till evening.

The members of the Academy reassembled at 7:30 P. M., when the following papers were read:

A Comparative Study of the Lung, by W. S. Miller, Madison.

On New and Rare Cladocera. (Read by Title.)

On Weissman's Theory of Heredity, by E. A. Birge, Madison.

The Academy then adjourned till the following day.

SESSIONS OF FRIDAY, DECEMBER 30.

The Academy met at 9 o'clock. In the absence of the president, Vice-President Blaisdell occupied the chair.

It was voted that the medal presented to the Academy by the Wyoming Geological and Historical Society of Wilkesbarre, Pa., be deposited in the collections of the State Historical Society.

In behalf of the committee on new members, Dr. Haskins made the following nominations:

For active membership:—

President Charles Kendall Adams, Madison.
Prof. C. H. Chapman, State Normal School, Milwaukee.
Prof. D. C. Jackson, Madison.
Prof. Richard T. Ely, Madison.
Mr. W. P. Blake, F. G. S. A., Shullsburg.
Dr. W. S. Miller, Madison.
Prof. E. B. Skinner, Madison.
Prof. F. G. Hubbard, Madison.
Prof. W. A. Scott, Madison.
Mr. David Kinley, Madison.
Prof. W. D. Parker, Madison.
E. A. Brown, M. D., Madison.
Mr. Willard Hodge, Chippewa Falls.
Miss Hattie B. Merrill, Milwaukee.
J. J. Davis, M. D., Racine.

For honorary membership:—

Prof. T. C. Chamberlin, University of Chicago, Chicago,
Ill.
Prof. Alexander Agassiz, Museum of Comparative Zoology,
Cambridge, Mass.

For corresponding membership:—

Robt. T. Litton, F. G. S., Honorary Secretary Geo-
logical Society of Australasia, 45 Queen St., Mel-
bourne, Victoria.
Dr. C. F. Hodge, Clark University, Worcester, Mass.
Prof. L. M. Hoskins, Stanford University, Palo Alto,
Cal.
Mr. Frank Leverett, F. G. S. A., 4103 Grand Boulevard,
Chicago, Ill.
Mr. S. D. Townley, A. M., Lick Observatory, Mt. Ham-
ilton, Cal.
Prof. R. D. Salisbury, University of Chicago, Chicago,
Ill.
Mr. George E. Luther, Grand Rapids, Mich.

The secretary was instructed to cast the ballot for the above
members.

On behalf of the committee to audit the treasurer's account, Dr. Haskins read a report in which it was stated that the vouchers had been examined and found to be correct. (This report is printed after the treasurer's report.)

The following papers were then read:

A New Method of Making Topographic Models, by F. H. King, Madison.

A Special application of Stadia Measurements, by C. H. Chandler, Ripon.

Notes on Sulphur Hexiodide, by Edward Kremers, Madison. (Read by Title.)

On a Possible Meaning of *Su* in the Rig Veda, by H. C. Tolman, Madison.

Index Antiphonteus. (Read by Title.)

The Case of Address in Plato, by F. L. Van Cleef, Madison.

Some Observations on the Modern Greek of the New Testament, by Paul S. Reinsch, Madison.

On the Structure and Systematic Position of *Bunops Scutifrons*, by Hattibel Merrill. (Read by title.)

Phases of Witticism, by J. D. Butler, Madison.

Some Suggestions Regarding the Methods of Psychological Study, by J. J. Blaisdell. Beloit.

Professor Blaisdell's remarks eulogizing the late Dr. A. L. Chapin, which had been postponed on Thursday, were then given.

The Academy then adjourned till afternoon.

The members reassembled at 2.30 P. M., and listened to the following papers:

Some Conditions of Success in Social Reform: by David Kinley, Madison.

On the Earliest Form of Roman Satire, by G. L. Hendrickson, Madison.

The Constitutional and Legal Aspects of Repudiation, by W. A. Scott, Madison.

Professor Barnes on behalf of the committee on nomination of officers, nominated Professor C. R. Van Hise of Madison as vice-president of the department of sciences, and Mr. I. M. Buell of Beloit as curator of the collection of fossils. The secretary was instructed to cast the ballot of the Academy for these officers.

Professor Barnes then made the following motion:

Moved, That the council of the Academy be empowered to take such action as may be necessary in connection with the meeting of the American Association for the Advancement of Science, which is to be held in Madison, and that they be authorized to appropriate from the funds of the Academy such sums, not exceeding one hundred dollars, as they may deem wise toward defraying the expenses of said meeting.

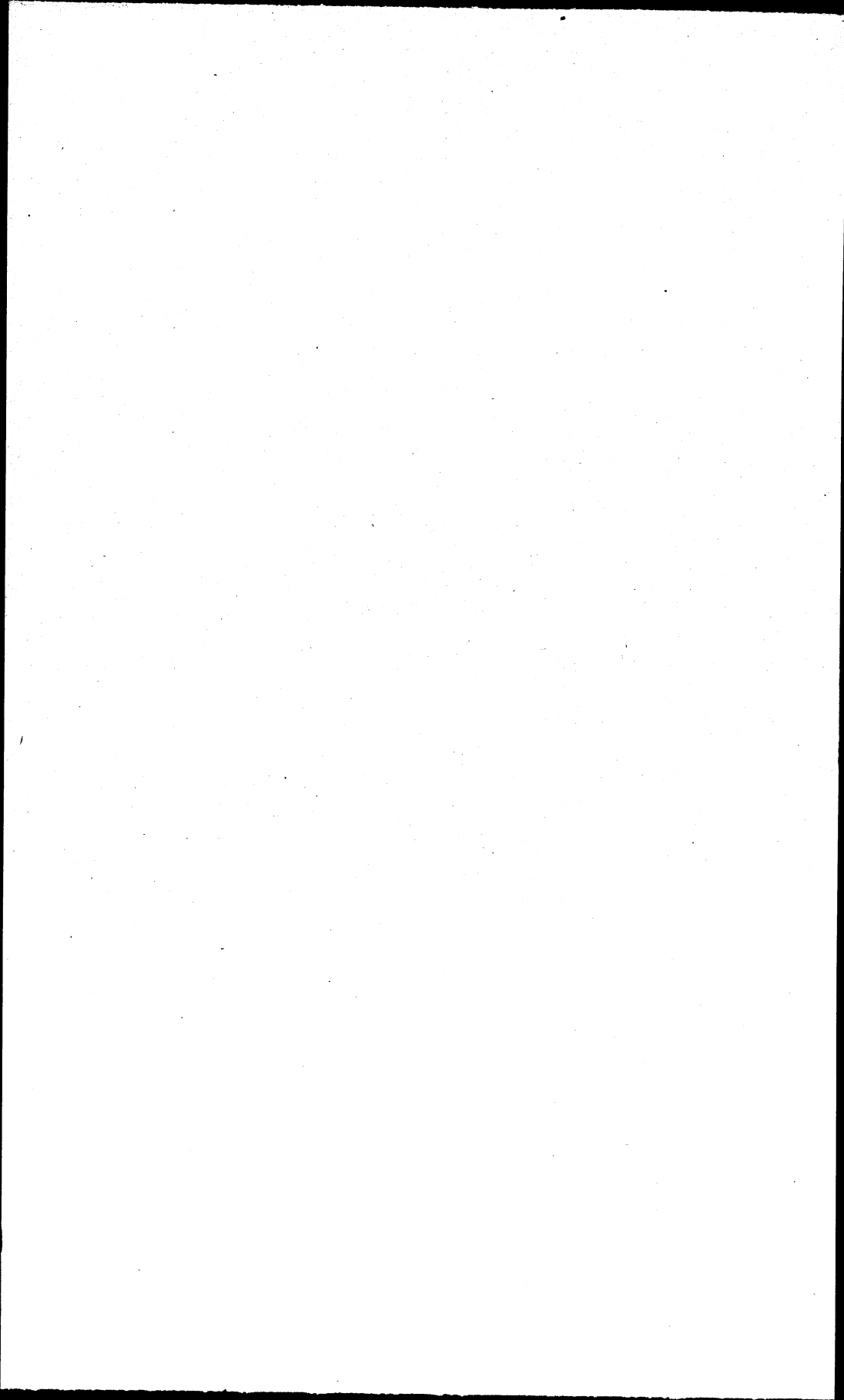
This motion was carried.*

The program of the meeting being finished the Academy then adjourned, *sine die*.

WM. H. HOBBS.

Secretary.

*On March 24th, 1893, the council authorized the treasurer to pay out of the funds of the Academy, to Mr. J. J. Suhr, the local treasurer of the Madison meeting A. A. A. S., the sum of one hundred dollars.—*Sec.*



TREASURER'S REPORT.

MADISON, WIS., December, 1892.

The Wisconsin Academy of Sciences, Arts and Letters,

GENTLEMEN: The following is a statement of the financial transactions of the Academy during the past year, viz.:

Balance on hand as per last statement.....	\$1,017	51
Received for interest on permanent fund.....		40 00
Received from members for initiation fees and annual dues.....		104 00
Received for set of Transactions sent to London Eng.	4	47
		\$1,165 95

The disbursements upon the order of the president and secretary have been as follows, viz.:

1891.		
Dec. 29,	T. A. Nelson for lettering on cases... No. 1	\$2 00
	Prof W. H. Hobbs, for postage and express..... No. 2	3 35
	L. S. Cheney for work in library..... No. 3	10 08
	Democrat Printing Co. for printing programs..... No. 4	3 35
1892.		
Jan. 6.	Carl Schmit for locks, etc.,..... No. 5	10 85
Feb 1.	Lord & Thomas for reproduction from diagram..... No. 6	5 56
	A. Zeese & Co. for cuts..... No. 7	2 90
	Prof. W. H. Hobbs for postage, express, etc.,..... No. 8	18 85
	Geo. E. Luther for writing, etc.,.... No. 9	1 80
	Silbernagel & Dean for Atlas Case... No. 10	7 00
March	State Journal Printing Co. for printing (circulars, stamped envelopes, etc.)..... No. 11	34 50
April 13,	L. S. Cheney, work in library, etc.,... No. 12	14 40
	W. M. Brennan, work in library..... No. 13	10 20
23,	A. Zeese & Co. for engravings..... No. 14	9 22
	State Journal Printing Co. for printing (circulars and postal cards).. No. 15	15 50
May 3,	A Zeese & Co. for half-tone portrait No. 16	10 00
	W. J. Park & Sons, for labels, etc.,... No. 17	8 08

	State Journal Printing Co. for printing slips.....	No. 18	1	75	
	Prof. W. H. Hobbs for postage, express, etc.,.....	No. 19	24	00	
May 26,	A. Zeese & Co. for diagrams.....	No. 20	18	31	
	W. M. Brennan, for cataloging library.....	No. 21	4	20	
27,	U. P. James, for Geology of Ohio....	No. 22	1	58	
June 11,	A. J. Smith for sending out Transactions.....	No. 23	10	80	
	Prof. W. H. Hobbs for cartage, express, etc.,.....	No. 24	4	58	
	State Journal Printing Co. for printing (programs, cards, etc.)	No. 25	6	75	
	G. Grimm for cartage.....	No. 25½	1	50	
	Rev. S. D. Peet for cuts for Transactions.....	No. 26	5	00	
Aug. 1,	Delos Kinsman for card cataloging in library.....	No. 27	12	33	
8,	Chi. St. Paul, Railway for freight....	No. 28	9	39	
16,	State Journal Printing Co. for printing (programs).....	No. 29	1	75	
Oct. 22,	Am. Ex., Co. expressage.....	No. 30	1	65	
Nov. 16,	N. B. Carr, case for cards.....	No. 31	1	50	
	State Journal Printing Co. for printing (stationary).....	No. 32	6	00	
	Democrat Printing Co. for printing..	No. 33	22	50	
Dec. 8.	F. H. Crane, for cataloging in library	No. 34	24	00	\$325 13
					<hr/>
					\$840 85

Balance on hand December 1892, eight hundred and forty and eighty-five one-hundredths dollars.

Respectfully submitted,

SAMUEL D. HASTINGS,

Treasurer.

The committee to whom was referred the report of the Treasurer have examined the vouchers and find the report correct. They recommend that it be received and adopted.

At the request of the Librarian it is stated the expenditures of the year were increased so far beyond the usual amount by the printing and postage necessary on securing additions to the list of exchanges, and gifts of pamphlets to the Academy.

Respectfully submitted,

E. A. BIRGE,

C. H. HASKINS,

December 29, 1892.

Committee.

REPORT OF THE LIBRARY COMMITTEE.

Presented at the Annual Meeting of the Academy, December 29th 1892.

MADISON, WIS., December 29th, 1892.

The Wisconsin Academy of Sciences, Arts and Letters,

Gentlemen: The binding and cataloging of the books of the Academy, which will soon be completed, makes it important that a more suitable place be found for the storing of these books. The present location of the books in the cases of the academy room is undesirable for a number of reasons, most important of which are the unsafe condition of the building, the ready access of dirt and fallen plaster to the shelves and the difficulty of providing proper protection from theft. It is impossible to keep from the books the finely disintegrated plaster which is constantly falling from the walls. The free access of the public to the rooms, owing to the use of it for other purposes than those of the Academy, renders the proper protection of the books a very difficult matter. During the past year the glass fronts of cases have been frequently broken and one case has been forcibly opened by cutting the wood away from the bolt. The cataloging of the books has shown that in the past many have been lost or stolen. Moreover the space available is already crowded, while the library is growing through its numerous exchanges and through the completion of its existing series of journals.

In view of the facts above stated, we earnestly recommend that an appeal be made to the legislature at its next session, for the erection of a building to accommodate the libraries of the State Historical Society and the Academy. If these two libraries and the library of the State University, which is greatly in need of new quarters, were under one roof, it would

be greatly to the advantage of those who make use of any or all of these libraries and it would make the collections thus properly housed a just cause for state pride.

Respectfully submitted,

WM. H. HOBBS,

G. L. HENDRICKSON,

G. C. COMSTOCK.

Library Committee.

REPORT OF THE LIBRARIAN.

MADISON, WIS., September 1st, 1893.

Wisconsin Academy of Sciences, Arts and Letters

Gentlemen: The following report is for the years 1890-93, the term during which I have served as Librarian of the Academy. It includes the matter contained in my abstracted report, which was read at the annual meeting of 1892, and accordingly that report is not printed.

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GROWTH OF THE LIBRARY.

Additions to the List of Corresponding Societies:—Additions of standard scientific societies to the permanent exchange list of the Academy have been diligently sought. In February, 1892, a circular was printed and sent to a selected list of societies, whose publications were desired in exchange. Many societies were appealed to through the medium of a personal letter. When the eighth volume of the Transactions was issued, a considerable number of copies was sent out to societies not included.

in our list, as samples and in each was inserted a printed slip to indicate that an exchange of publications was desired. As a result of these efforts about one hundred and seventy societies have been added to our list of regular correspondents. In nearly every instance there has been correspondence definitely arranging the exchange. In a few cases in which no communication has been received from the secretary of a society arranging the exchange, a generous shipment of publications has been interpreted to indicate that one is desired. With few exceptions the exchanges are of a most satisfactory character and will be the means of greatly strengthening the library.

The list of these societies is given below arranged according to place of issue. A number of them were included in the list of Corresponding Societies, which was printed in the appendix of the eighth volume of the Transactions, an asterisk there indicating that they were recent accessions to that list.

- Amherst (Massachusetts) Agricultural Experiment Station,
Publications.
- Antwerp (Belgium) Societe Royale de Geographique. Bulletin.
- Ann Arbor (Michigan) Engineering Society of the University
of Michigan. "The Technic."
- Augsburg (Germany) Naturhistorischer Verein fur Schwaben u.
Neuberg in Augsburg. Berichte.
- Austin (Texas) Geological Survey of Texas. Publications.
— Texas Academy of Science. Transactions.
- Belfast (Ireland) Belfast Nat. History and Philosophical Society.
Reports and Proceedings.
- Bergamo (Italy) Ateneo di Scienze, Lettere e Arti in Bergamo.
Atti.
- Berlin (Germany) Zeitschrift fur Instrumentenkunde. (Dr. A.
Westphal, Redacteur, Joichimsthalerstr. 35).
— Deutsche Geologische Gesellschaft. Zeitschrift.
— Apotheker Zeitung (Organ des Deutschen Apotheker-
Vereins).
— Zeitschrift f. Praktische Geologie. (Edited by Dr. Max
Krahmann, Wetzlar, Rheinprovinz).
— Arbeiten aus dem Kaiserlichen Gesundheitsamte.

- Gesellschaft für Erdkunde zu Berlin. Verhandlungen und Zeitschrift.
- Berne (Switzerland) Schweizerische Entomologische Gesellschaft.
- Bone (Algiers) Academie d' Hippone. Bulletin.
- Bonn (Germany) Naturhistorischer Verein d. preuss. Rheinlande, Westfalens u. d. R. B. Osnabruck. Verhandlungen.
- Bordeaux (France) Societe Linneenne de Bordeaux. Proces-Verbaux.
- Boston (Mass.) (Mass. Institute of Technology.) Technology Quarterly, Abstracts of Proceedings of Society of Arts.
- Breslau (Germany) Verein für schlesische Insektenkunde zu Breslau. Zeitschrift.
- Zeitschrift für Entomologie.
- Brussels (Belgium) Societe Belge de Microscopie, Bulletin.
- Brussels and Liege (Belgium) Melanges Geologiques par G. Dewalque.
- Budapest (Hungary) Termeszetráji Füzetek. (A periodical devoted to Botany, Zoology, Mineralogy and Geology. Edited by the Hungarian National Museum at Budapest.)
- Hungarian Geological Society. (Foldtani Kozlony.) Journal.
- Societe Hongroise de Geographie. Publications.
- Cairo (Egypt) Institut Egyptien. Bulletin.
- Calcutta (India) Asiatic Society of Bengal. Journal.
- Cardiff (Wales) Cardiff Naturalists Society. Report and Transactions.
- Cassel (Germany) Realschule. Program.
- Verein f. Naturkunde.
- Champaign (Illinois) The Technograph. (Published by the University of Illinois).
- Chapel Hill (North Carolina) State Geological Survey. Publications.
- Cherbourg (France) Societe Nationale des Sciences Naturelles et Mathematiques de Cherbourg. Memoires.
- Chicago (Illinois) Association of Engineering Societies. Journal.
- Chur (Switzerland) Naturforschende Gesellschaft Graubundens. Jahresbericht.
- Coimbra (Portugal) Sociedade Brotreana. Bolitim.

- Colorado Springs (Colorado) Colorado College Studies. Papers read before the Colorado College Scientific Society.
- Des Moines (Iowa) Geological Survey of Iowa. Publications.
- Donai (France) Union Geographique du Nord de la France. Bulletin.
- Donaueschingen (Germany) Verein für Geschichte u. Naturgeschichte der Baar zu Donaueschingen.
- Dresden (Germany) Königliches Mineralogisches Museum. Mitth., Führer, etc.
- Edinburgh (Scotland) Geological Society of Edinburgh. Transactions.
- Ekatherinebourg (Russia) Societe Ouralienne d'Amateurs des Sciences Naturelles a Ekatherinebourg. Bulletin.
- Erlangen (Germany) Physikalisch-Medicinische Societat in Erlangen. Sitzungsberichte.
- Frankfurt a. O. (Germany) Naturwissenschaftlicher Verein des Reg. Bez. Frankfurt. Monatl. Mitth. a. d. gesamm. Geb. d. Naturwissenschaften. (Herausgegeben von Dr. Ernst Huth.)
 — Societatum Litteræ. (Herausgegeben von Dr. Ernst Huth.)
- Geneva (Switzerland) Societe de Physique et d'Histoire naturelle de Geneve.
 — Societe de Geographie de Geneve. Journal.
- Gera (Germany) Gesellschaft von Freunden d. Naturwissenschaften in Gera. Verhandlungen and Jahresberichte.
- Glasgow (Scotland) Geological Society of Glasgow. Transactions.
 — Natural History Society of Glasgow. Proceedings and Transactions.
- Granville (Ohio) Scientific Laboratories of Denison University. (W. G. Tight, Editor) Bulletin.
 — The Journal of Comparative Neurology. (C. L. Herrick, Editor.)
- Greifswald (Germany) Geographische Gesellschaft zu Greifswald. Jahresbericht.
- Haarlem (Holland) Koloniaal Museum to Haarlem. Bulletin.
- Hamburg (Germany) Verein für Naturwissenschaftliche Unterhaltung in Hamburg. Verhandlungen.

- Naturwissensch. Verein in Hamburg. Abh. a. d. Gebiete d. Naturwissenschaften.
- Helsingfors (Finland) Commission Geologique de la Finlande. Carte Geologique de Finlande.
- Hermannstadt (Hungary) Siebenburgischer Verein für Naturwissenschaften in Hermannstadt. Verh. u. Mitth.
- Indianapolis (Indiana) Geological Survey of Indiana. Publications.
- Innsbruck (Austria) Naturwissensch.-Medicinis. Verein in Innsbruck.
- Iowa City (Iowa) Iowa State University Natural History Laboratories. Bulletin.
- Ithaca (New York) Cornell University. Scientific Bulletin, Library Bulletin, Occasional Publications.
- Jefferson City (Missouri) Geological Survey of Missouri. Publications.
- Jena (Germany) Universitäts-Bibliothek. (Dr. K. K. Müller, Oberbibliotheker) Dissertations and other Publications.
- Baden (Germany) Badischer Botanischer Verein. Mittheilungen.
- Kassel (Germany) Verein f. Naturkunde zu Kassel. Bericht.
- Kew (England) Royal Gardens, Hooker's *Icones Plantarum*.
- Kiel (Germany) Mineralogisches Institut der Universität Kiel. (Prof. Johannes Lehmann, Editor.) Mittheilungen.
- Naturwissenschaftlicher Verein für Schleswig-Holstein. Schriften.
- Kolozsvart (Hungary) Ertesito. Sitzungsbericht der Medicinisch-naturwissenschaftlichen Sectionen des Siebenburgischen Museumvereins. I. Medicinische Abtheilung. II. Naturwissenschaftliche Abtheilung. (In the Zend language with abstracts in German.)
- Konigsberg (Germany) University of Königsberg. Dissertations.
- Physikalisch-Ökonomische Gesellschaft zu Königsberg. Schriften.
- Preussischer Botanischer Verein in Königsberg.
- Lansing (Michigan) Geological Survey of Michigan. Publications.
- Lawrence (Kansas) University of Kansas. University Quarterly.

- Leeds (England) Leeds Geological Association. Transactions.
- Leipa (Austria) Nordbohmischer Excursions-Club. Mittheilungen.
- Leipzig (Germany) Naturforschende Gesellschaft zu Leipzig. Sitzungsberichte.
- Zeitschrift d. Naturwissenschaft.
- Lille (France) Societe Geologique du Nord. Memoires.
- Lincoln (Nebraska) University of Nebraska. University Studies.
- Lisbon (Portugal) Commissao dos Trabalhos Geologicos de Portugal. Communicacoes.
- Liverpool (England) Liverpool Geological Society. Proceedings.
- Loben (Austria) Frederich Katzer, K. K. Berg Akademie, Loben, Styria, Austria.
- London (England) Geological Society. Abstracts of Proceedings.
- Annals of British Geology (Edited by J. F. Blake) Journal.
- Society of Arts. (Secretary, John St., Adelphi, London W. C.) Journal.
- British Museum (Natural History) (Cromwell Road; London, S. W.) Natural History Publications.
- Queckett Microscopical Society. Journal.
- Lunaburg (Germany) Naturwissenschaftlicher Verein fur das Furstenthum Luneburg, Jahreshette.
- Lyon (France) Societe Botanique de Lyon. Bulletin.
- Magdeburg (Germany) Naturwissenschaftlicher Verein fur Magdeburg. Jahresberichte und Abhandlungen.
- Manchester (England) Manchester Geographical Society. Journal.
- Manchester Geological Society. Journal.
- Marburg (Germany) Gesellschaft zur Beforderung der gesamt. Naturw. zu Marburg.
- Konigliche Universitats-bibliothek. Dissertations.
- Melbourne (Victoria) Royal Society of Victoria.
- Geological Society of Australasia. Transactions.
- Milan (Italy) Societa d'Esplorazione Commerciale in Africa.

- Minneapolis (Minn.) University of Minnesota. Bulletin.
- Montgomery (Alabama) Geological Survey of Alabama. Publications.
- Montreal (Canada) Royal Society of Canada. Proceedings and Transactions.
- Munich (Germany) Bayerische botanische Gesellschaft zur Erforschung der heimischen Flora. Berichte.
- Munster (Germany) Westfälischer Provinzial-Verein für Wissenschaft und Kunst. Jahresbericht.
- Naples (Italy) Societa di Naturalisti in Napoli. (L. Savastano, President.)
- New Haven (Connecticut) Connecticut Academy of Arts and Sciences. Transactions.
- New York (N. Y.) New York Academy of Science. Transactions and Annals.
- Columbia College. (School of Mines Quarterly.)
- American Geographical Society. Journal.
- The "Auk," a Quarterly Journal devoted Exclusively to Ornithology (L. S. Foster, publisher.)
- Odessa (Russia) Club Alpin de Crimee. (M. le. Prof. Kamienski, Secy.) Publications.
- Padua (Italy) Societa Veneto Trentino di Scienze Naturali Residenti in Padua. Atti.
- Revista di Mineralogia e Cristallografia Italiana.
- Paris (France) Prefecture de la Seine. Annuaire Statistique de la Ville de Paris.
- Feuille des Jeunes Naturalistes. (Adrian Dollfus, 35 rue Pierre Charron.)
- Philadelphia (Pa.) The American Naturalist.
- Franklin Institute. Journal.
- Portland (Maine) Portland Society of Natural History.
- Poughkeepsie (N. Y.) Vassar Brother's Institute and its Scientific Section. Transactions.
- Quebec (Canada) Geographical Society of Quebec. Transactions.
- Riga (Russia) Rigascher Garten-Bau Verein. Jahresbericht.
- Naturforscher Verein. Korrespondenzblatt.
- Rome (Italy) British and American Archeological Society of Rome. Journal.

- Rassegna delle Scienze Geologiche in Italia. (Edited by M. Cermenati and A. Telleni.)
- Rostock (Germany) Verein der Freunde der Naturgeschichte in Andreasberg. (Prof. E. Geinitz, Secy.) Archiv.
- Rotterdam (Holland) Societe Batave de Philosophie Experimentale de Rotterdam.
- Rouen (France) Societe normandie de Geographie. Bulletin.
- Saint Petersburg (Russia) Russisch-Kaiserliche Mineralogische Gesellschaft. Verhandlungen. Materialien zur Geologie Russlands.
- San Francisco (California) Astronomical Society of the Pacific. Publications.
- Santiago (Chili) Societe Scientifique du Chile. Actes.
- Schaffhausen (Switzerland) Schweizerische Entomologische Gesellschaft. (Editor, Dr. G. Stierlin, Schaffhausen.) Bulletin.
- Shanghai (China) China Branch of the Royal Asiatic Society. Journal.
- Springfield (Illinois) Geological Survey of Illinois. Publications.
- Stavanger (Norway) Stavanger Museum. Aarsberetning.
- Stockholm (Sweden) Kongl. Svenska Vetenskabs-Akademiens Tradgard Bergielund. Acta Horti Bergiani.
- Strassburg (Germany) University of Strassburg. Dissertations.
- Commission fur die Geologische Landesuntersuchung von Elsass-Lothringen. Mittheilungen.
- Sydney (New South Wales) University of Sydney. Calendar.
- Royal Society. Journal and Proceedings.
- New South Wales Government Board for International Exchanges. Publications.
- Thronhjem (Norway) Det Kongelige Norske Videnskabernes Selskabs. Skrifter.
- Tokio (Japan) Deutsche Gesellschaft f. Natur- und Volkerkunde Ostasiens. Mittheilungen. (Formerly Yokohama.)
- Tokio Geographical Society. Journal.
- Topeka (Kansas) Kansas State Historical Society. Historical Collections.
- Toulouse (France) Societe francaise de Botanique. Revue de Botanique (Bulletin Mensuel de la Societe). (Address M. le Secretaire general de la Societe francaise de Botanique, 19, rue Ninan. Toulouse).

- Trieste (Austria) Osservatorio Marittimo di Trieste. Rapporto Annuale.
- Tubingen (Germany) Verein f. Geschichte u. Naturgeschichte der Baar u. d. angrenz. Landestheile in Donaueschingen. Schriften.
- Tucson (Arizona) School of Mines. Publications.
- Vienna (Austria) K. K. Universitats-Bibliothek. Publications.
- K. K. Geologische Reichsanstalt. (Dr. D. Stur, Director.) Jahrbuch und Verhandlungen.
- Allgemeine osterr. Chemiker und Techniker Zeitung. (Hans Urban, Redacteur Wien XVIII, 2.)
- Wiener Illustrierte Garten Zeitung (Organ d. K. K. Gartenbau Gesellschaft.)
- Washington (D. C.) U. S. Coast and Geodetic Survey. Publications.
- National Academy. Memoirs.
- Philosophical Society of Washington. Bulletin.
- National Geographical Society. Magazine.
- Waterville (Maine) Library of Colby University.
- Weimar (Germany) Thuringischer botanische Verein. Mittheilungen.
- Wellington (New Zealand) Colonial Museum and Geological Survey.
- New Zealand Institute. Transactions and Proceedings.
- Wernigerode (Germany) Naturwissenschaftlicher Verein des Harzes zu Wernigerode. Schriften.
- Worcester (Massachusetts) American Antiquarian Society. Transactions.
- Worcester Society of Antiquity. Proceedings.
- Wurzburg (Germany) K. K. Universitats-Bibliothek. Dissertations.
- Zurich (Switzerland) Schweizerische Botanische Gesellschaft. (Prof. J. Jaeggi, Bot. Garten in Zurich, Switz). Berichte.
- Zurich-Hottingen (Switzerland) International Entomological Society. (Fritz Ruhl, Zurich-Hottingen.)

Additions to Existing Sets of Journals: In February, 1892, with the approval of the library committee, a circular letter form was printed, which could be filled out and sent to socie-

ties of whose publications our set was incomplete. This circular when filled out stated the volumes desired, and the volumes of the Transactions which could be sent in exchange. When an exchange of publications had been recently begun with a society, earlier volumes of the society's publications were requested in exchange for a more or less complete set of the Academy's Transactions. A large number of these circulars have been sent out, and many have met with favorable responses, but in nearly every case the sets of the more important journals have been secured through personal correspondence with the secretary of the society. The result has been very satisfactory, the aggregate value of the books obtained in this way amounting to several hundred dollars. Many of the sets received, which have been nominally exchanges, so far exceed in value the return we were able to make, that they must be considered gifts to the Academy. Instances of this are the following important journals, which are selected from the list given below: Hooker's *Icones Plantarum*, *Zeitschrift der Deutschen Geologischen Gesellschaft*, *Jahrbuch und Verhandlungen der K. K. Geologischen Reichsanstalt*, *Verhandlungen der Kaiserlichen Mineralogischen Gesellschaft (St. Petersburg)*, *Bulletins and Memoirs of the Museum of Comparative Zoology*, and *Proceedings of the American Association for the Advancement of Science*. Most of the mentioned volumes are not to be found in any other library in the state.

The following is a list of the more important volumes received:—

Massachusetts Institute of Technology—Proceedings of the Society of Arts, Years 19-23, 25-29. Technology Quarterly, Vols. I-IV (except No. 1 of Vol. I.)

"The Auk" (Quarterly Journal of Ornithology), Vols. VI-IX.

American Antiquarian Society—Transactions, Vols. I, III-VII. Partial Index of Proceedings, by Stephen Salisbury, Jr. Catalog of Collections.

American Geographical Society—Journal, Vols. VIII-XXIII.

National Geographical Society—Magazine, Vols. I-III.

State of Maine—Geology of Maine, 2d and 3d Annual Re-

ports. Maine Board of Agriculture, embracing also the Reports on the Scientific Survey, 6th and 7th Reports (1861 and 1862).

Philosophical Society of Washington—Bulletin, Vols. I–XI (complete).

Gesellschaft v. Freunden d. Naturwissenschaften in Gera—Verhandl., Vols. II–III. Jahresber., 7–9, 11–13, 16–35.

Naturwissenschaftlicher Verein in Magdeburg—Jahresber. u. Abhandl., 1885–1891.

Hooker's *Icones Plantarum*—Vols. XI–XX; XXI, 1–3; XXII.

Museum of Comparative Zoology—Bulletin, Vols. I, VI, VII, 2–11; VIII, XI, XII, XX, 8. Illustrated Catalog (included in Memoirs), Nos. 1–3, 5, 6. Memoirs, Vols. V, 2; VI, 1, i–ii, 2; VII, 2, ii–iii; VIII, 3; IX, 1–2; X, 1, 3.

Princeton College—Contributions from the E. M. Museum of Geology and Archæology, Bulletins 1 and 3, and Vol. I, No. 1, of Memoirs.

Portland Society of Natural History—Proceedings, Vol. I, 1–2 (1862 and 1869). Proceedings, Sessions of 1880–1881, 11th, 13th, 14th and 16th meetings. Proceedings, Sessions of 1881–1882, 1st, 3rd, 8th, 10th and 11th meetings. Proceedings, Sessions of 1888–1889, 9th meeting. Journal, Vol. I, No. 1 (1864). The Portland Catalog of Maine Plants. (1868).

Harvard University Library—Bibliographical Contributions, Nos. 8, 12, 17, 19, 22, 26, 29, 30, 33–44.

Revista di Mineralogia e Cristalografia Italiana, Vols. VI–X.

Geological Survey of Texas—Annual Reports I–II.

Manchester Geographical Society—Journal, Vols. I–III; IV, 7–10; V, 1–6, 10–12.

Katzer's *Geologie v. Bohmen*.

Geological Society of Glasgow—Transactions, Vols. VII, VIII.

Deutsche Geologische Gesellschaft—Zeitschrift, Vols. XXIV–XLIII. (Complete since 1872.)

K. K. Naturhistorischen Hofmuseum—Annalen, Vols. III, 4; IV, 1, 4; VI, 3, 4.

Geological Society of London—Abstracts of Proceedings, 1885–1892.

Comitato Geologico d'Italia—Bolletino, Vols. I–V.

Leeds Geological Association—Transactions, 1886–1892.

Commission für die Geologische Landesuntersuchung von Elsass-Lothringen—Mitth., Vols. I–III, IV 1.

Liverpool Geological Association—Transactions (Journal), Vols. II, IV–VI, IX–XII.

Comité Geologique de la Russie—Memoires, Vols. II, 2, 3; III 1, 2, 4; IV 2; V 1, 5; VIII 1, 2; IX 1; X 1; XI 1, 2; XIII 1. Bulletin, Vols. IV 8–10; V 1–8; VII 6–10; VIII–XI.—Bibliothèque Geologique, 3, 4, 5, 6.

United States Geological Survey—Annual Reports, VIII 2. Bulletins 1, 30, 31, 33, 37–41, 53. Mineral Resources, 1885.

K. K. Geologische Reichsanstalt—Jahrbuch, Vols. XXXVI–XLII (1886–1892). Verhandlungen, 1886–1892.

Société Geologique du Nord—Memoires, Vols. I–III.

Kaiserliche Mineralogische Gesellschaft (St. Petersburg)—Verhandlungen, Vols. X–XXIX and Register.

American Association for the Advancement of Science—Proceedings, Vols. I–XXIV, XXX, XXXII, XXXIV, XXXV. (Completing our series).

National Academy of Sciences—Memoirs, Vols. I, II, III, IV 1, 2.

Naturforschende Gesellschaft in Berne—Mittheilungen, 1870–1872, 1882, Nos. 1040–1056; 1883, Nos. 1057–1063.

Worcester Society of Antiquity—Proceedings, Foundation to 1877; also 1878, 1879–1882, 1884–1890. Constitution and By-Laws. Papers, Nos. 4, 8, 22, 25.

Naturforschende Gesellschaft in Emden—Jahresber. 57–65, 67, 69. Kleine Schriften, V, VI, VII, IX–XIII. Festschrift herausgegeben in Veranlassung der Jubelfeier ihres 50-jährigen Bestehens am 29ten December, 1864. Die Gewitter des Jahres 1855.

Association of Engineering Societies—Journals, Vols. I, 5–12; II–VI, VII, 1–6, 9–12; VIII–XI.

United States National Museum—Bulletins 11, 13, 14, 17, 18, 20–32, 34, 37. Proceedings (several volumes).

Nova Scotian Institute of Natural Science—Vols. II, pt. 4; IV, 4; V, 1, 2, 4; VI, 1–4; VII, 1–2.

Real Academia de la Historia—Boletín, Vols. I, pts. 1–4; II,

4; V, 1-4; VI, 5-6; VIII, 1, 3, 5; IX, 4, 6; X, 1; XI, 1-3; XII, 1-6; XIV, 5-6; XV, 1-3; XIX, 4; XXI, 6.

Norwegian North Atlantic Expedition—Crustacea II Sars; Buccinidæ, Friele; Mollusca II, Friele; Holothuroidea, Daniellssen and Koren; Annelida, Hansen; Fishes, Collett.

Nordbohmisches Excursionsclub—Mittheilungen, Vols. XII-XV, 1889-1892.

Revue de Botanique, Vols. III-VII.

Academie des Sciences, Belles Lettres et Arts de Lyon—Memoires: Classe des Sciences, Vols. XXX-XXXI, 1889-1892; Classe des Lettres, Vols. XXVII-XXVIII, 1890-1892; 3d Series, Sciences et Lettres, Vol. I, 1893.

Prefecture de la Seine—Annuaire Statistique de la Ville de Paris, Annees VII-VIII. Catalogue de la Bibliotheque Administrative (Section Etrangere).

Cincinnati Society of Natural History—Journal, Vols. XII, 1-3; XIV, 2.

Zeitschrift fur Entomologie—Neue Folge, Hefts 1-17, 1870-1892.

War Department—Report of Secretary, 1876, I, II, 1-3; 1877, I, II, 1; 1878, I, II, 1-3; 1879, I, II, 1-3, III; 1880, I, II, 1-3; 1881, I, II, 1-3, III.

John Hopkins University—Circulars; many back numbers.

The Canadian Record of Science—Vols. I-III, Nos. 1, 3, 5-8; IV, 1-2, 4-8; V, 1-5.

Feuille des Jeunes Naturalistes—Annees 7-10. 2d Series, Vols. I-II. 3d Series, Vol. I.

Bulletin de la Societe Ouralienne d'Amateurs des Sciences Naturelles—Vols. IV-VII, VIII, 1; X-XII.

The following were received from the library of the University of Wisconsin, being duplicates exchanged for duplicates in the Academy library:

Geological Survey of Ohio—Geology, Vols. I and II; Paleontology, Vols. I and II; Maps, 1873; First Annual Report.

Geological Survey of New Jersey—Vols. I; II, pts. 1 and 2.

Geological Survey of Indiana—Maps and Colored Section, 1869; Vols. for 1870, 1872, 1873; Maps, 1872.

The volumes in the following list have been obtained from the secretary of the State Agricultural Society. On examining these books it was noticed that in a number of cases they filled lacunæ in our own series. It is thus probable that, in those cases at least, they have been sent to the State Agricultural Society through error. The secretary of the society has, therefore, turned over the volumes to the Academy so that they may supplement our sets and be accessible for use. With his permission the librarian has communicated with the societies concerned, requesting that hereafter the journals be addressed to the Academy, and not to the Agricultural Society.

K. Akademie v. Wissenschaften, Wien. Sitzungber.* (Math. Naturw. Classe.) Abth. I, Vols. XCI, 5; XCII, 3-5; XCVIII, 8-10; C, 1-7. Abth. II, Vols. XCI, 3-5; XCIII, 1-3; XCV, 3; XCVI, 2-5. Abth. IIa, Vols. XCII, XCIII, 4-10; XCIX, C, 1-7. Abth. IIb, Vols. XCVIII, 4-10; XCIX, C, 1-7. Abth. III, Vols. XCI, 3-5; XCII, XCV, 1-5; XCVI, XCVIII, 5 10; XCIX, C, 1-7.

R. Istituto Lombardo di Scienze e Lettere—Rendiconti, 2d Series, Vols. XV, XVI, XIX, XXII-XXIV. Memorie, Classe di Sci. Math. e Natur., Vols. XVI, 2-3; XVII, 1.

Archives Neerlandaises des Sciences Exactes et Naturelles, Vols. XVII, 2; XX, 1; XXV, 1; XXVII, 1-2.

Ofversigt Finska Vetenskaps-Societetens Forhandlingar, Vols. XXII-XXIV.

Proceedings Manchester Philosophical Society, Vols. XXI, XXII, XXV, XXVI.

Acta Societ. Scient. Fennicæ, Vol. XVII.

Finlands Natur och Folk, 43, 50, 51.

Memoires Acad. Caen, 1892.

Verhandlungen Naturf. Gesellsch. Basel, Th. VIII, Hft. 1.

Accad. Gioenia di Scienze Naturali in Catania—Atti, 3d Se-

*A complete set of the Sitzungsberichte of the Vienna Academy (Math. Naturw. Classe) does not exist in Madison, and I believe not in Wisconsin. The University has an incomplete set, extending to the sixtieth volume, but this also has many lacunæ. These facts have been set before Professor Suess, the general secretary of the Vienna Academy, with the request that the gaps in both series be filled, so that between the two libraries a complete set may be found in Madison.

ries, Vol. XX; 4th Series, Vols. IV-V. *Bulletino Mensile*, 1892, fasc. 26-31.

Nova Acta R. Societatis Scientiarum Upsaliensis—3d Series, Vols. XIII, 2; XIV, 1.

Jahresber. d. Schles. Gesellsch. f. Vaterland. Cultur, Vols. LXIII, LXV, LXVII-LXIX (with *Erganzungsbande*).

American Museum Natural History—*Bulletin*, Vol. III, No. 1. *Ann. Rep.*, etc., 1892.

Tijdschrift Nederl. Maatsch. Nijverheid, 1883, 1885.

Bulletin Societe d'Agriculture, Sciences et Arts de la Sarthe, Vols. XXXI, 3-4; XXXII, 4; XXXIII, 2, 4; XXXIV, 1.

Koninklijke Akademie van Wetenschappen, Amsterdam—*Verslagen en Mededeelingen*. Afd. *Natuurkunde*, 2d Series, Vol. XVIII; 3d Series, Vols. V-VII. Afd. *Letterkunde*, 2d Series, Vol. XII; 3d Series, Vols. V-VII. *Verhandelingen*—Afd. *Natuurkunde*, Vols. XXVI, XXXVIII. Afd. *Letterkunde*, Vols. XVIII, XIX. *Jahrboeck*, 1882, 1888-1890.

Atti Fondazione Scientifica Cagnola (Milan), Vols. VII, IX, X.

Die Optischen Anomalien der Krystalle (6 plates), by Reinhard Brauns.

Exploration Internationales des Regions Polaires, 1882-83 et 1883-84. Expedition Polaire Finlandaise, Vol. I.

There is much more that can be done in the direction of filling out our series of journals. A glance at the catalog (in appendix to this volume) will show that a complete series of books is still the exception to the rule. Many sets still incomplete in our library have been filled as far as is possible, but the filling of others has not been attempted.

Gifts of Scientific Papers by Individuals.—Early in 1892 the Library Committee issued a circular asking scientific workers to generously donate brochures of their personal publications to the library of the Academy. It was thought that in this way a valuable addition might be made to the Academy Library, in which most scientific men would be glad to bear the small part asked of them. It was promised that the gifts should be promptly acknowledged by mail and also in the librarian's re-

port. This circular has been sent out somewhat widely as regards territory, but it has been confined pretty largely to geologists, mineralogists and botanists. Circulars were sent first to these workers because the necessary lists were ready at hand, and perhaps also because the papers of the first two classes of workers have the greatest interest to the librarian personally. The circulars would have found wider distribution but for the fact that the time that the librarian could devote to his duties was soon absorbed by the work of cataloging and binding the books of the Library. Yet as a result of the limited distribution of the circulars and within something more than a year, the papers of the following long list have been received at the library. They have been duly acknowledged by mail and cataloged. It will be noted that geological brochures largely predominate.

ACKNOWLEDGMENT OF BROCHURES.

- Ackermann, Karl. Repertorium der landeskundlichen Literatur für den Königlich-Preussischen Regierungsbezirk Kassel. With Nachträge 1, 2 and 3.
- Bestimmung der erdmagnetischen Inklination von Kassel.
- Adler, Cyrus. Progress of Oriental Science in America during 1888.
- Report on the Section of Oriental Antiquities in the U. S. National Museum, 1888.
- Allen, J. A. The North American Species of the Genus *C. auratus*, considered with Special Reference to the Relationships of *C. auratus* and *C. cafer*.
- Arthur, J. C. Report on Botanical Work in Minnesota for the year 1886.
- Atkinson, Geo. F. Ordema of the Tomato.
- Method for obtaining pure Culture of Pammel's Fungus of Texas Root Rot of Cotton.
- Carnation Diseases.
- Some Cercosporae from Alabama.
- The Genus *Frankia* in the United States.
- An Automatic Device for Rolling Culture Tubes of Nutrient Agar Agar.

- Some Diseases of Cotton.
- Monograph of the Lemnaceæ of the United States.
- Averill, C. K. List of Birds found in the Vicinity of Bridgeport, Conn.
- Backstrom, Helge. Ueber den Dahllit, ein neues Mineral von Odegarden, Bamle, Norwegen.
- Beitrage zur Kenntniss der islandischen Liparite.
- Uber Fremde Gesteinseinschlusse in Einigen Skandinavischen Diabasen.
- Uber Angeschwemmte Bimsteine und Schlacken der Nord-europaischen Kusten.
- Om kvartskakelagren vid Guda, Norge.
- Beitrage zur Kenntniss der Thermelektricitat der Krystalle.
- Elektrisches und thermisches Leitungsvermogen des Eisenglanzes.
- Balg, G. H. Braune's Gothic Grammar (translated by Balg).
- First Germanic Bible (edited by Balg).
- Glossary of Gothic Language.
- Ballou, S. M. The Eye of the Storm.
- Baltzer, A. Glacialgeologisches v. der Sudseite der Alpen.
- Barrois, C. Memoire sur la Distribution des Graptolites en France.
- Faune du Calcaire d'Erbray. Lille, 1889.
- Beecher, C. E. The Development of a Paleozoic Poriferous Coral.
- Symmetrical Cell Development in the Favositidae.
- Bell, R. The Nickel and Copper Deposits of Sudbury District, Canada. (Presented by Geo. H. Williams.)
- Billet, A. Contribution a L'etude de la Morphologie et de Developpement des Bactereacees.
- Branner, J. C. The Relations of the State and National Geological Surveys to Each Other and to the Geologists of the Country.
- Brigham, A. P. The Geology of Oneida County.
- A Chapter in Glacial History with Illustrative Notes from Central New York.
- Rivers and the Evolution of Geographic Forms.

- Broadhead, Prof. G. C. Preliminary Report on Coal by Arthur Winslow, State Geol.
- A Description of the Lower Carboniferous Crinoids from Missouri by S. A. Miller.
- A Bibliography of the Geology of Missouri by F. A. Sampson.
- Brooks W. K. Salpa in its Relation to the Evolution of Life.
- Brown, Nathan Clifford. A Catalogue of the Birds known to occur in the Vicinity of Portland, Me.
- Carbaugh, Harvey C. A Course of Instruction for Non-commissioned Officers.
- Chapman, C. H. An Elementary Course in Theory of Equations.
- Cheney, L. S. and True, R. H. On the Flora of Madison and Vicinity. A Preliminary Paper on the Flora of Dane County, Wisconsin.
- Clark, W. B. The Surface Configuration of Maryland.
- Clarke, F. W. Note on the Constitution of Ptilolite and Mordenite.
- Claypole, E. W. On the Structure of the American Pteraspidian, Palæaspis with Remarks on the Family.
- The Head of Dinichthys.
- Cohen, E. Lava vom Camerun Gebirge.
- Das Obere Weilerthal und das Zunachst Angrenzende Gebirge.
- Ueber die Trennung v. Thonerde, Eisenoxyd u. Titansaure.
- Goldfuhrende Conglomerate in Sud-Afrika.
- Ueber den Granat der sudafricanischen Diamantfelder und uber den Chromgehalt der Pyrope.
- Ueber Jadeit v. Thibet.
- Ueber Speckstein, Pseudophit und dichten Muscovit aus Sud-Afrika.
- Titaneisen v. den Diamantfeldern in Sud-Afrika.
- Ueber Lavae v. Hawaii u. Einigen anderen Inseln des Grossen Oceans nebst einigen Bemerkungen uber glasige Gesteine im Allgemeinen.
- Mikroskopische Physiographie der petrographisch-wichtigen Mineralien, by H. Rosenbusch. (Review of.)

- Optischer Schlüssel zur Bestimmung des Krystallsystems v. Mineralien in Gesteinsdunnschliffen.
- Ueber eine Pseudomorphose nach Markasit aus der Kreide von Arkona auf Rugen.
- Eine Verbesserte Methode der Isolierung von Gesteinsgemengtheilen vermittelst Flusssaure.
- Das labradoritfuhrende Gestein der Kuste von Labrador.
- Ueber pleochroitische Hofe im Biotit.
- Berichtigung bezuglich des "Olivin-Diallag-Gesteins" von Schriesheim im Odenwald.
- Ueber einen Aventurinquarz aus Ostindien.
- Andalusitfuhrende Granite.
- Nekrolog v. Jonas Gustav Oscar Limarsson.
- Die Goldproduction Transvaals im Jahre 1889.
- Mandelstein aus den Maluti-Bergen, Sud-Afrika.
- Ueber einige eigenthumliche Melaphyr-Mandelsteine aus Sud-Afrika.
- Geognostisch-petrographische Skizzen aus Sud-Afrika.
- Ueber die Entstehung des Seifengoldes.
- Zusammenstellung petrographischer Untersuchungsmethoden nebst Angabe der Literatur.
- Meteoreisen-Studien II.
- Ueber den Meteoriten von Zsady, Temesvar Comit, Banat.
- Review of A. E. Nordenskiold's Mineralogische Beitrage 6.
- Chemische Untersuchung des Meteoreisens von S. Juliao de Moreira, Portugal, sowie einiger anderen Hexaedrischen Eisen.
- Cohen, E. und Deecke, W. Ueber das Krystalline Grundgebirge der Insel Bornholm.
- Sind die Storungen in der Lagerung der Kreide an der Ostkuste von Jasmund (Rugen) durch Faltungen zu Erklaren. (Presented by Dr. E. Cohen.)
- Ueber Geschiebe aus Neu-Vorpommern und Rugen. (Presented by Dr. E. Cohen.)
- Cohen, E. und Weinschenk, E. Meteoreisen Studien. (Presented by Dr. E. Cohen.)

- Collin, Dr. A. Ueber die Regenwurmer der Umgegend von Berlin.
- Notiz ueber *Guathostoma hispidum* Fedtsch. aus dem Rinde.
- *Criodrilus lacuum* Hoffne.
- Committee of Colorado Scientific Society. Report on the Technical Determination of Zinc.
- Comstock, George C. Provisional Results of a Determination of the Constant of Aberration.
- Comstock, Dr. Theo. B. University of Arizona School of Mines, Plan of Organization, Equipment and Relations to the Public, Bulletin No 1.
- Oil and Natural gas in Illinois.
- Notes on the Geology and Mineralogy of San Juan County, Colorado.
- The Geology and Vein-Structure of Southwestern Colorado.
- A Preliminary Report on the Geology of the Central Mineral Region of Texas from 1st Annual Report, 1889.
- Report on the Geology and Mineral Resources of the Central Mineral Region of Texas.
- Crepin, F. Observations sur Quelques Plantes fossiles des Depots devoniens Rapportes par Dumont a L'Etage quartzschisteux Inferieur de son Systeme Eifilien.
- Fragments Paleontologiques pour Servir a la Flore du Terrain Houiller de Belgique.
- Materiaux pour servir a L'Histoire des Roses. Parts III and IV.
- Note sur le Pecopteris Odontopteroides Morris.
- Cross, Whitman. Post Laramie Deposits of Colorado.
- Constitution and Origin of Spherulites in Acid Eruptive Rocks.
- The Post-Laramie Beds of Middle Park, Colo.
- Cross, Whitman and Eakins, L. G. A new Occurrence of Ptilolite.
- Culver, G. E. On a Little Known Region of Northwestern Montana.
- Culver, G. E. and Hobbs, Wm. H. On a new Occurrence of Olivine Diabase in Minnehaha Co., South Dakota.

- Dahms, P. H. Ueber einige Eruptivgesteine aus Transvaal in Sud-Afrika. (Presented by Dr. E. Cohen.)
- Davis, W. M. Geographical Illustrations.
- The General Winds of the Atlantic Ocean.
 - Outline of Elementary Meteorology.
 - Lost Volcanoes of Connecticut.
 - The Catskill Delta in the Post-Glacial Hudson Estuary.
 - Theories of Artificial and Natural Rainfall.
- Davis, W. M. and Wood, J. W. Geographic Development of Northern New Jersey.
- Deichmuller, J. V. Ueber Urnenfunde in Uebigan bei Dresden.
- Die Meteoriten des Koniglichen Mineralogischen Museums in Dresden.
 - Ueber Gefasse mit Graphit Malerei aus sachischen Urnenfeldern.
- Dickerman, Q. E. (with M. E. Wadsworth.) An Olivine-Bearing Diabase, from St. George, Maine.
- Diller, J. S. The Late Volcanic Eruption in Northern California and its Peculiar Lava.
- Geology of the Taylorville Region of California.
 - Note on the Cretaceous Rocks of Northern California.
 - Notes on Peridotite of Elliot County, Kentucky.
 - Fulgurite.
- Egleston, T. Leaching Gold and Silver Ores in the West.
- The Method of Collecting Flue-dust at Ems on the Lahn.
- Eldridge, G. H. Phosphates of Florida.
- The Florence Oil Field, Colorado.
 - Peculiar Structural Features in the Foot Hill Regions of the Rocky Mountains, near Denver, Col.
- Elmer, H. C. The Copulative Conjunctions Que, Et. Atque in the Inscriptions of the Republic in Terence and in Cato. (A Dissertation presented for the degree of Doctor of Philosophy.)
- Evermann, B. W. The Yellow-billed Magpie.
- Bird Migration.
 - The Wood Ibis in Indiana.
 - Birds of Carroll Co., Indiana.

- Evermann, B. W. and Fordice, M. W. List of Fishes Collected
 . in Harvey and Cowley Counties, Kansas.
- Evermann, B. W. and Bollman, C. H. Notes on Collection of
 Fishes from the Monongahela River.
- Farish, John B. On the Ore deposits of Newman Hill.
- Felix, Prof. Dr. J. Die fossilen Holzer Westindiens.
 — Untersuchungen uber fossile Holzer.
 — Beitrage zur Kenntniss der Gattung Protosphyrama Leidy.
 — Geologie und Paleontologie der Republik Mexico, III
 Theil.
- Fernald, M. L. The Portland Catalogue of Maine Plants.
- Ficalho, Conde de. Flora dos Lusidas.
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 Equations.
 — On the Most Probable value of the Latitude and its Theo-
 retical Weight, from Entangled Observations occuring in
 the Use of Talcott's Method.
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 Bulletin Nos. 133 and 134.
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 Manchester.
 — Nachtragliche Mittheilungen uber die rothen u. bunten
 Mergel der oberen Dyas bei Manchester.
 — Die Versteinerungen des lithographischen Schiefers im
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- Rocks from the Tonga Islands.
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- Successive Stages of Slaty Cleavage.
- Cause of Slaty Cleavage.
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- Contortion and Metamorphism.
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- Note on Blue Hornblende of Mynydd Mawr.
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- Alkali Lands, Irrigation and Drainage, 1886.
- Reports on Examinations of Waters, Water Supply, etc., 1889.
- Reports of Experiments on Methods of Fermentation, etc., 1888.
- Report on Agricultural Experiment Station of the University of California, 1890.
- Supplement to Biennial Report of Board of Regents of the College of Agriculture of the University of California, 1879, 1887, and Supplement No. 1.
- Sulphuring in Fruit Drying, Bulletins 80, 88-90, 92-96.

- Report of the Work of the Agricultural Experiment Station for Year 1890.
- Reports of the Professors in Charge to the President, 1884, 89, 90.
- Notes on California Olives: Their Adaptation and Oils.
- Investigations of California Oranges and Lemons.
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- Revision of the North American Poriferæ, parts 1 and 2, with remarks upon Foreign Species.
- Several numbers of Science with Short Papers.
- Genetic Relations of Stephanoceras.
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- Abstract of Larval Theory of Origin of Tissue.

- The Protocouch of Cephalopoda.
- Carboniferous Cephalopods.
- The Larval Theory of the Origin of Cellular Tissue.
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- Additions to Catalogue of Lower Silurian Fossils, Cincinnati Group.
- Conspectus of Twenty Natural Orders to be used in Analysis.
- A Revision of the Genus *Clematis* of the U. S.
- Monograph of the Monticuliporoid Corals of the Cincinnati Group.
- Section of the Magdoketa Shales in Iowa.
- Report of the Executive Board of the Society of Natural History.
- Illustrations of the Fauna of the St. John Group, No. 1, by G. F. Matthew.
- On the Age of the Mt. Pleasant Ohio Beds.
- Manual of the Paleontology of the Cincinnati Group, parts 1 and 2.
- An Ancient Channel of the Ohio River at Cincinnati.
- Biography of U. P. James.
- Catalogue of Lower Silurian Fossils of the Cincinnati Group.
- Janson, A. v. Die Mineralien-Sammlung des Rittergutsbesitzers A. von Janson auf Schloss Gerdauden in Ostpreussen.
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 - Lower Carboniferous Gasteropoda from Burlington, Iowa. The American Species of Polyphenopsis. Sphaerodoma; a Genus of Fossil Gasteropods. (Two Copies.)
 - A Geological Section Across the Piedmont Plateau in Maryland. (A supplement to a paper by G. H. Williams, entitled "The Petrography and Structure of the Piedmont Plateau in Maryland.")
 - Stratigraphy of the Carboniferous in Central Iowa.
 - The Naticoid Genus Strophostylus.
 - Surface Geology of Burlington, Iowa.
 - Discovery of Fossils in the Limestones of Frederick County, Maryland.
 - The Sedentary Habits of Platyceras.
 - An Annotated Catalogue of the Mollusca of Iowa.
 - Review of the Progress of American Invertebrate Paleontology for the Year 1890.
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 - Review of the Progress of American Invertebrate Paleontology for the Year 1889.
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- Problems for Zoologists.
 - Some Points in the Development of *Molgula Manhattanensis*.

- Knop, Dr. A. Beitrag zur Kenntniss der in den Diamantfeldern von Jagersfontein (Sud-Afrika) vorkommenden Mineralien und Gesteine. (Presented by Dr. E. Cohen.)
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- Precious Stones.
- On a large Garnet from New York Island.
- Article on Precious Stones.
- The Gem Collection of the U. S. National Museum.
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- Gold Ornaments from United States of Columbia.
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- Massachusetts Institute of Technology. Publications of the Massachusetts Institute of Technology, and of its Officers, Students and Alumni, 1862-1887, Compiled by William Ripley Nichols.
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- Petroleum, Natural Gas, Etc.
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- Important Public Collections of American Archaeology in the United States.
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— Untersuchungen über Bau und Wachstum der Farne. II.
— Blütenbildungen beim Schneeglockchen und Samenformen bei der Eiche.
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- Die Bedeutung des Baltischen Hohenrucksens für die Eiszeit.
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- Mittheilungen über das Alluvium der Rathenower Gegend.
- Ueber zwei conchylienführende Lossablagerungen nordlich vom Harz.

- Beitrag zur Lössfrage.
- Zur Frage der Oberflächengestaltung im Gebiete der baltischen Seenplatte.
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- Description of a New Genus of the Order Eurypterida from the Utica Slate.
- Paleozoic Notes; New Genus of Cambrian Trilobites, *Mesonacis*.
- Classification of the Cambrian System of North America.
- Note on the Genus *Archeocyathus* of Billings.
- The Taconic System.
- Cambrian Age of the Roofing Slates of Granville, Washington Co., New York.
- Fauna of the "Upper Taconic" of Emmons, in Washington County, New York.
- Discovery of Fossils in the Lower Taconic of Emmons.
- The Taconic System of Emmons, and the Use of the Name Taconic in Geologic Nomenclature.
- Cambrian Fossils from Mount Stephens, Northwest Territory of Canada.

- Paleontologic Notes.
- Notes on Paleozoic Rocks of Central Texas.
- Notes on some Paleozoic Pteropods.
- Stratigraphic Position of the *Olenellus* Fauna in North America and Europe.
- Description of New Forms of Upper Cambrian Fossils.
- A Review of Dr. R. W. Ells's Second Report on the Geology of a Portion of the Province of Quebec; with additional Notes on the "Quebec Group."
- Study of a Line of Displacement in the Grand Canon of the Colorado in Northern Arizona.
- Warner, Dr. A. G. Report of the Superintendent of Charities for the District of Columbia for Year ending June 30, 1891, by G. F. Pope, Supt.
- Weinschenk, E. Beitrage zur Mineralsynthese. (Presented by Dr. E. Cohen.)
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- Colestin von Mineral County, West Va.

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- The Gabbros and Diorites of the "Cortlandt Series."
- On the Paramorphosis of Pyroxene to Hornblende in Rocks.
- A Summary of Progress in Mineralogy and Petrography in 1885.
- On a Remarkable Crystal of Pyrite from Baltimore County, Md.
- Note on some Remarkable Crystals of Pyroxene from Orange County, N. Y.
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- The Missouri Coal Measures and the Conditions of their Deposition.
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- Coal Deposits of Missouri from field Work Prosecuted during the Years 1890 and 1891.
- Wulffing, E. A. Untersuchung eines Nephelinsyenits aus dem mittleren Transvaal, Sud-Afrika. (Presented by Dr. E. Cohen.)
- Yates, Dr. Lorenzo C. Charm Stones—The so-called Plummets or Sinkers of California.

- Third Biennial Report of the California State Board of Forestry for the years 1889 and 1890.
- Bulletin of the Santa Barbara Society of Natural History.
- Channel Islands; Stray Notes on the Geology of the Channel Islands; The Mollusca of the Channel Islands and Insular Floras.
- Zuccarelli, Angelo. Per un Gabinetto-Scuola di Antropologia Criminale Gianbattista della Porta da Fondarsi nell'Insegnamento Libero di Napoli.
- Da Deficienti ad Idioti, Studio Medico-Legale. I.
- A Divorzio e Scienza Antropologica Conferenza pronunciata il 5 Febbraio 1893 a vantaggio del Gabinetto-Scuola di Antropologia Criminale da Fondarsi nell'Insegnamento Libero di Napoli.

The librarian would like to emphasize to members of the Academy the importance of adding to the library in this manner. Many of us are specialists and find it difficult to get access to all books of reference which we need. There are prominent workers in different parts of the world who are engaged in the study of subjects related to those that most interest us. If we can then secure brochures of their publications, generally much scattered as to place of publication, we thereby obtain in the most convenient form and with little expense, that portion of a library of which we stand much in need. It is hoped that future librarians of the Academy will give a circular like the one already sent out, as wide a circulation among other classes of scientists as it has been given among geologists.

COPIES OF THE ACADEMY'S TRANSACTIONS ISSUED.

The eighth volume of the Transactions, which came from the printer in the summer of 1892, was sent out at once to all members of the Academy, and to the libraries of all the corresponding societies. An additional number of copies, estimated at about two hundred, was distributed as samples to societies not on our exchange list, with a view to initiating an exchange of publications with them. As required by law, one hundred copies were deposited in the library of the State Historical

Society, and a like number in the libraries of the State University and the State Agricultural Society.

TABLE SHOWING THE NUMBER OF BACK VOLUMES OF TRANSACTIONS DISTRIBUTED IN THE YEARS 1891-3.

WHERE SENT.	VOLUME.							Totals.
	I	II	III	IV	V	VI	VII	
Members of the Academy.....	3	15	16	16	17	17	17	101
Wisconsin Colleges and Incorporated Academies.....	0	7	16	16	13	16	14	82
Libraries in the United States and Canada..	8	20	31	28	31	35	37	190
Foreign Libraries (Through the Smithsonian Inst.).....	10	22	47	52	50	54	52	287
University of Wisconsin.....	0	20	30	0	40	75	0	165
Totals.....	21	84	140	112	151	197	120	825

The back volumes of the Transactions, with the exception of volume I, have been extensively utilized in securing exchanges with foreign scientific societies. Only a limited number of copies of volume II being still in the possession of the academy, that volume has not been so generally distributed as the others. The libraries of the colleges and incorporated academies of the state are entitled to receive the publications of the Academy (See list on page ix of volume VIII of the Transactions) and their sets of the Transactions have been made as complete as possible. Mr. Wm. M. Smith, the librarian of the University of Wisconsin, has informed me that the volumes of the

Transactions have not always in the past been deposited in that library as provided for by law. To make good so far as possible this oversight, copies as follows have been sent to the library of the university and Mr. Smith has expressed himself as satisfied with the arrangement: volumes II, twenty copies; III, thirty copies; V, forty copies; and VI, seventy-five copies.

Recently elected members of the Academy have been furnished sets of the Transactions as nearly complete as the supply would warrant. As provided in the statutes, express charges on volumes sent out are paid by the state. Packages for foreign distribution are delivered through the agencies of the Smithsonian Institution.

CATALOG OF THE LIBRARY.

In 1878 a catalog of the books in the Academy library was made by the then librarian, Mr. W. A. Germain, and printed in the Proceedings (Transactions, Volume IV., pp. 281--289). An indication of the growth of the library since that time is the fact that there were but eighty exchanges, and the catalog was easily brought within eight pages of text. Again in 1881 a catalog was made by Mr. Julius Nelson, acting for Dr. E. A. Birge. This catalog was printed in the Proceedings (Transactions, Volume V, pp. 335--358.) It covers twenty-two pages of text and was probably complete for that time. I do not know that any later attempts have been made to supplement this catalog. Since 1881 the library has increased much in size as is shown by the dimensions of the new catalog which is printed in the appendix of this volume. The catalog of 1881 has been of comparatively little service because it tells only *what* is to be found in the library, and not *where* it is to be found. It has in consequence been necessary to search the entire collection to find any volume that might be desired. With the growth of the library this difficulty has increased, and accessions have generally become separated from the series to which they belong. When the present librarian took charge of the library, the books were in this condition and it was found necessary to begin the work anew and to take everything from

the cases and reclassify. The cases being emptied were thoroughly cleaned and the books dusted. The cases were then numbered, the shelves lettered and the locks repaired. In replacing the books on the shelves after their arrangement in series, an attempt was made to place related series together. On account of the necessity of economizing space it was not always possible to do this, but in general the distribution has been as follows:

General works (Such as journals of scientific societies), 1-12, 19, 25, 30, 31.

Works treating the field of letters, 27.

Agriculture, 28, 29.

Geography, 13.

Anthropology, 25, 26.

Geology, 13-18.

Archeology, 25, 26.

Mathematics, 21.

Astronomy, 20, 21.

Medicine, 29.

Bibliography, 23.

Meteorology, 21.

Botany, 22,

Statistics, 23, 24.

Engineering, 20.

Zoology, 22.

In the fall of 1881, the librarian received authority to engage clerical assistance to begin the cataloging of the library. The plan that seemed best adapted to the library in its present form was a shelf catalogue making use of cards. Mr. L. S. Cheney, then fellow in the University of Wisconsin and the librarian's assistant, was engaged to begin the work. The task was soon found to be much more arduous than had been supposed, owing to the careless manner in which the early volumes had been bound. In numerous instances, parts of several volumes had been bound as one volume, the missing portions being scattered under other covers. Title pages and indices were frequently missing but as frequently bound in the middle of the volume. Books had thus to be examined page by page and a "carving process" applied to the bound copies before anything like order was brought out of chaos. Authority was given at the next annual meeting to continue the work and several students of the University have at different times assisted the librarian as Mr. Cheney did at first. The card catalog which has finally been completed and from which the printed catalog

in the appendix of this volume has been made, has cost for clerical assistance a little more than seventy-five dollars. The librarian has given his own time in good measure to the work or the expense would have been considerable.

The catalog includes, first, a complete list of the series of journals, arranged alphabetically according to the city from which they are issued. Reference is in each instance made to the case and shelf where the book is to be found. Works of a special character follow grouped under their proper subjects; as, Agriculture, Anthropology, etc., the sequence of the subjects being alphabetical. Under each subject, E. G., Geology, are to be found, first, all journals and other serials which treat geological topics alone. (These journals are also entered in the general list of journals at the beginning of the catalog.) Following the serials under any subject are the non-serial works, whether books or pamphlets, arranged alphabetically according to author. Each book is located by case and shelf, but this is unnecessary in the case of pamphlets, since all pamphlets treating a given subject are arranged together on the shelves. The location is given in the catalog once for all for a given subject at the beginning. The arrangement of the pamphlets on the shelves, as in the catalog, is alphabetical, those with one initial letter being separated from their neighbors by stiff boards. This method has its defects and is only temporary, but if ordinary care is exercised in handling the pamphlets, the method will suffice for present needs. The idea throughout has been to have the catalog flexible, so that it can easily be modified if needed when the library is larger, without requiring the work that is just finished to be repeated.

BINDING OF BOOKS IN THE LIBRARY.

At the Ripon Field Meeting in 1892, the librarian recommended to the Academy the binding of the unbound books then in the library. It was then voted to give authority to the library committee (The librarian and Professors Hendrickson and Comstock) to expend money in binding the books. In view of the fact that the books of the library vary considerably

n value, it was decided by the committee to suit the binding to the book in each case. The more valuable books were then to be bound in half morocco, while others were to be bound in sheep or roan. Many it was thought best not to bind. Discretion in this regard was left with the librarian. The binding was given by the committee to the Madison Book Bindery, G. Grimm, at the following prices:

Size.	Kind of Binding.	Price per Volume.
$5\frac{1}{2} \times 7\frac{1}{2}$	$\frac{1}{2}$ Morocco.....	60c.
$5\frac{1}{2} \times 7\frac{1}{2}$	$\frac{1}{2}$ Roan or Buffing.....	50c.
$5\frac{1}{2} \times 7\frac{1}{2}$	$\frac{1}{2}$ Sprinkled Sheep.....	50c.
$6\frac{1}{2} \times 9$	$\frac{1}{2}$ Morocco.....	70c.
$6\frac{1}{2} \times 9$	$\frac{1}{2}$ Roan or Buffing.....	60c.
$6\frac{1}{2} \times 9$	$\frac{1}{2}$ Sprinkled Sheep.....	65c.
9×13	$\frac{1}{2}$ Morocco.....	90c.
9×13	$\frac{1}{2}$ Roan or Buffing.....	75c.
9×13	$\frac{1}{2}$ Sprinkled Sheep.....	85c.

This work was begun in the fall of 1892, and up to the present (September 1st, 1893) the number of books bound and returned to the shelves of the library is 513, of which 160 are bound in half morocco, 69 in half sprinkled sheep and 284 either in half roan or buffing. The bills paid for this binding by the treasurer amount to \$349.25, which makes the average cost per volume 68 cents. There are now in process of binding at the Madison bindery, 221 volumes, and at Park's bindery 125 volumes (same terms as Madison bindery.) These should be bound and on the shelves of the library before the next (24th) annual meeting of the Academy. When these are ready 859 volumes will have been bound. Most of the unbound volumes still in the library cases—excluding some issues of series which have been received at the library within two years—either do not seem to warrant a binding or they have come to the library somewhat stoutly bound in paper or boards (often sewed), and in *whole volumes* with the designation of the volume printed on the back. Many of the latter volumes are quite

valuable and it may be advisable to bind them—a matter which should be settled by the Academy. A die consisting of the words "Wisconsin Academy of Sciences" enclosed in a lozenge has been prepared, and is now used in the marking of all covers. It was found to be impossible to include the whole name of the Academy without either making the lozenge too large or the letters too small.

A record of all books sent to and returned from the bindery has been kept by the librarian, and at least one other member of the library committee has looked over the books bound before the payment of bills.

PLAN OF TEMPORARY DISTRIBUTION OF BOOKS TO MEMBERS.

It is thought that with the issuing of an adequate catalog of the library, members both in Madison and elsewhere will wish to make use of the library for purposes of reference. I anticipate that some of the members at the University of Wisconsin in particular, will desire to use the books extensively. No provisions have yet been made for the issuing of books, and while the books remain in their present location, an altogether adequate provision can not easily be made. The room should not be left open without an attendant, as we have already suffered too much from depredations. Nor should any but some officer who is responsible for the books be given free access to the shelves, as it would be an easy matter to introduce confusion into the library if volumes were not returned to their proper places. I would therefore suggest that the librarian be elected from the members resident in Madison, and that only he or his assistant have access to the shelves of the library. Members desiring the use of books should apply to the librarian, who would supply the volumes desired upon the signing of the proper receipt form. Any reasonable number of books might be taken at one time and kept for any reasonable length of time, so long as they were kept in frequent use. But should the librarian have reason to think the books were no longer in use and retained because of neglect, he might at his discretion call them in. If books issued to any member were

afterwards desired by another member, the one using them might be notified of the fact by the librarian, and would then be required to return them within two weeks from the date of issuing the notification. Detention of books beyond this time should be punished by a fine sufficiently large to insure prompt and safe return. Members non-resident in Madison could have the use of books on the same terms as residents, the books being forwarded to them by express and the charges paid by them. Persons other than members should in the discretion of the librarian, be allowed to consult the books at the library, but books should not be issued to them. These regulations are, I apprehend, all that would be necessary, but if it were found that others were desirable they might be added later.

The plan proposed to issue books to members on request would add somewhat to the work of the librarian or his assistant, and they should, I think, be paid according to the amount of time devoted to the library. The proper care of the library in its present condition is considerable, and the best results will be secured if a nominal compensation is given the librarian. This the academy is able to do.

NEED OF BETTER QUARTERS FOR THE LIBRARY.

The Library committee in their report at the annual meeting of 1892, emphasized the necessity of securing better quarters for the books. Not only are the books unsafe and inaccessible in their present location, but they are liable to be considerably damaged by remaining where they are. The major part of the collection is now bound, and some of the more valuable books are nicely bound. As the cases have no backs, but rest against the rough plaster, it is impossible to keep from the books finely disintegrated plaster which shakes down from the walls. The books become covered with a considerable layer of this material, which is so gritty as to abrade the skin when the books are handled. On opening a book this material gets between the leaves and plates. Moreover the cases are already nearly filled (many are quite full) and the library is growing so fast through our exchanges that the cases will no longer be made to contain all the books.

A bill was presented in the last legislature providing ample quarters for this library, together with the libraries of the University of Wisconsin and the State Historical Society, in a building to be located on the university campus. It is very much to be regretted that this bill did not pass that body. Until such a bill is passed by a future legislature one can only call attention to the need without suggesting any immediate means of meeting it.

Respectfully submitted,

WM. H. HOBBS,

Librarian.

REPORT OF THE CURATOR.

BELOIT, Wis., Sept. 6th, 1893.

The Wisconsin Academy of Sciences, Arts and Letters,

GENTLEMEN—The classification and labelling of the fossils has been begun and completed during the past year. This material consists wholly of the fossils contributed to the Academy by the Wisconsin Geological Survey.

Two collections from this source have been in the possession of the Academy, but for lack of room these have of late been kept in the geological museum of the University. The smaller and more valuable of these contains only the type fossils described and figured by Prof. Whitfield in the publications of that survey. The other is one of the twelve subordinate collections into which the remaining fossil material was divided after its classification at that time.

Only the first collection was of any especial value to the Academy, and last winter the other was loaned indefinitely to the University to replace a similar collection lost in the destruction of the old Science Hall by fire.

During the year these collections have been labelled, the first as a separate collection, the specimens bearing an Academy label, and occupying one of the cases in the geological museum at the University entirely apart from the other University collections.

The fossils of the second collection have been arranged with the University collections, but are distinguished from others by the name of the association placed on each label.

This has seemed to us to be the best disposal that could be made of this property of the association, as it renders the

specimens accessible to any who may wish to study the fossil fauna of our state, and at the same time makes it possible to reclaim the material if at any time in the future the Academy should possess a suitable place for its occupancy.

Very respectfully yours,

IRA M. BUELL.

REPORT OF THE COMMITTEE APPOINTED TO REVISE THE CONSTITUTION.

Wisconsin Academy of Sciences, Arts and Letters,

GENTLEMEN—At the 23rd annual meeting of the Academy, the president and secretary were made a committee to prepare a revised draft of the constitution for adoption at a subsequent meeting. In September 1893 the committee added to its members the treasurer and Dr. E. A. Birge. The constitution which they offer for the Academy's consideration to replace the one now in force is as follows:

CONSTITUTION OF THE WISCONSIN ACADEMY OF SCIENCES, ARTS AND LETTERS.

ARTICLE I.—NAME AND LOCATION.

This association shall be known as the Wisconsin Academy of Sciences, Arts and Letters, and shall be located at the city of Madison.

ARTICLE II.—OBJECT.

The object of the Academy shall be the promotion of sciences, arts and letters in the state of Wisconsin. Among the special objects shall be the publication of scientific papers and the formation of a library.

ARTICLE III.—MEMBERSHIP.

The Academy shall include four classes of members, viz: life members, honorary members, corresponding members and active members.

1. Life members shall be elected on account of special services rendered the Academy. Life membership in the Academy

may also be obtained by the payment of one hundred dollars and election by the Academy. Life members shall be allowed to vote and to hold office.

2. Honorary members shall be elected by the Academy, and shall be men who have rendered conspicuous services to science.

3. Corresponding members shall be elected from those who have been active members of the Academy, but have removed from the state. By special vote of the Academy men of attainments in science or letters may be elected corresponding members. They shall have no vote in the meetings of the Academy.

4. Active members shall be elected by the Academy and shall enter upon membership on the payment of an initiation fee of two dollars and the annual assessment of one dollar. The annual assessment shall be remitted for the president, secretary and librarian during their terms of office.

ARTICLE IV.—OFFICERS.

The officers of the Academy shall be a president, a vice-president for each of the three departments of sciences, arts and letters, a secretary, a treasurer, a librarian and a custodian. These officers shall be chosen by ballot by the Academy at an annual meeting and shall hold office for three years. Their duties shall be those usually performed by officers thus named in scientific societies. It shall be one of the duties of the president to prepare an address which shall be delivered before the Academy at the annual meeting at which his term of office expires.

ARTICLE V.—COUNCIL.

The council of the Academy shall be entrusted with the management of its affairs during the intervals between regular meetings, and shall consist of the president, the three vice-presidents, the secretary, the treasurer and the past presidents who retain their residence in Wisconsin. Three members of the council shall constitute a quorum for the transaction of

business, provided the secretary and one of the presiding officers be included in the number.

ARTICLE VI.—COMMITTEES.

The standing committees of the Academy shall be a committee on publication, a library committee, and a committee on the nomination of members. These committees shall be elected at the annual meeting of the Academy in the same manner as the other officers of the Academy and shall hold office for the same term.

1. The committee on publication shall consist of the president and secretary and a third member elected by the Academy. They shall determine the matter which shall be printed in the publications of the Academy. They may at their discretion refer papers of a doubtful character to specialists for their opinion as to scientific value and relevancy.

2. The library committee shall consist of three members and shall include the librarian.

3. The committee on nomination of members shall consist of five members, one of whom shall be the secretary of the Academy.

ARTICLE VII.—MEETINGS.

The annual meeting of the Academy shall be held in Madison between Christmas and New Year. Summer field meetings will be held at such times and places as the Academy or the council shall decide. Special meetings may be called by the council.

ARTICLE VIII.—PUBLICATIONS.

The regular publication of the Academy shall be known as its Transactions, and shall include scientific papers, a record of its proceedings and any other matter pertaining to the Academy. This shall be printed by the state as provided in the statutes of Wisconsin. All members of the Academy shall receive gratis the current issues of its Transactions.

ARTICLE IX.—AMENDMENTS.

Amendments to this constitutions may be made at any annual meeting by a vote of three-fourths of all the members present, *provided*, that the amendment has been proposed by five members, and that notice has been sent to all the members, at least three months before the meeting.

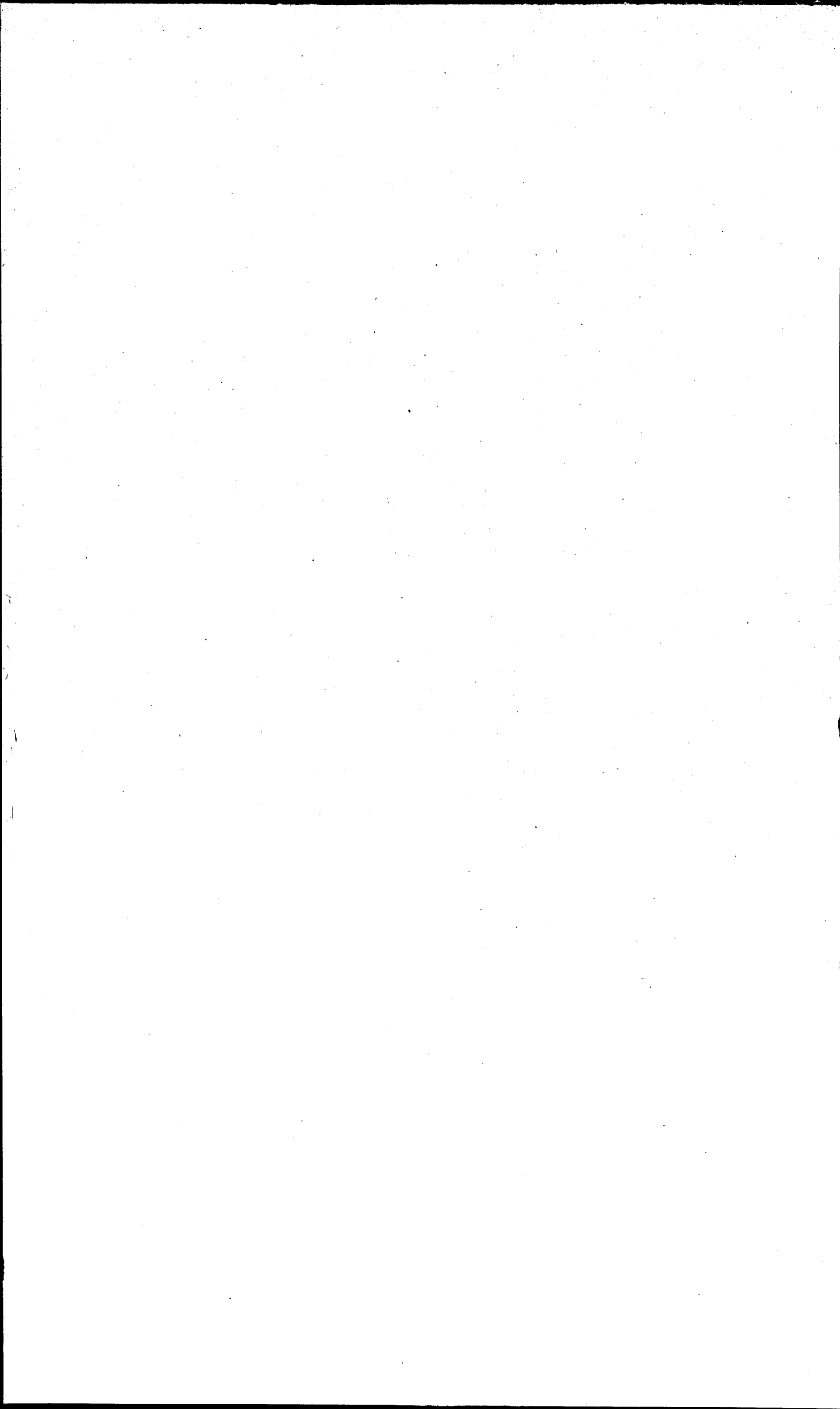
Respectfully submitted,

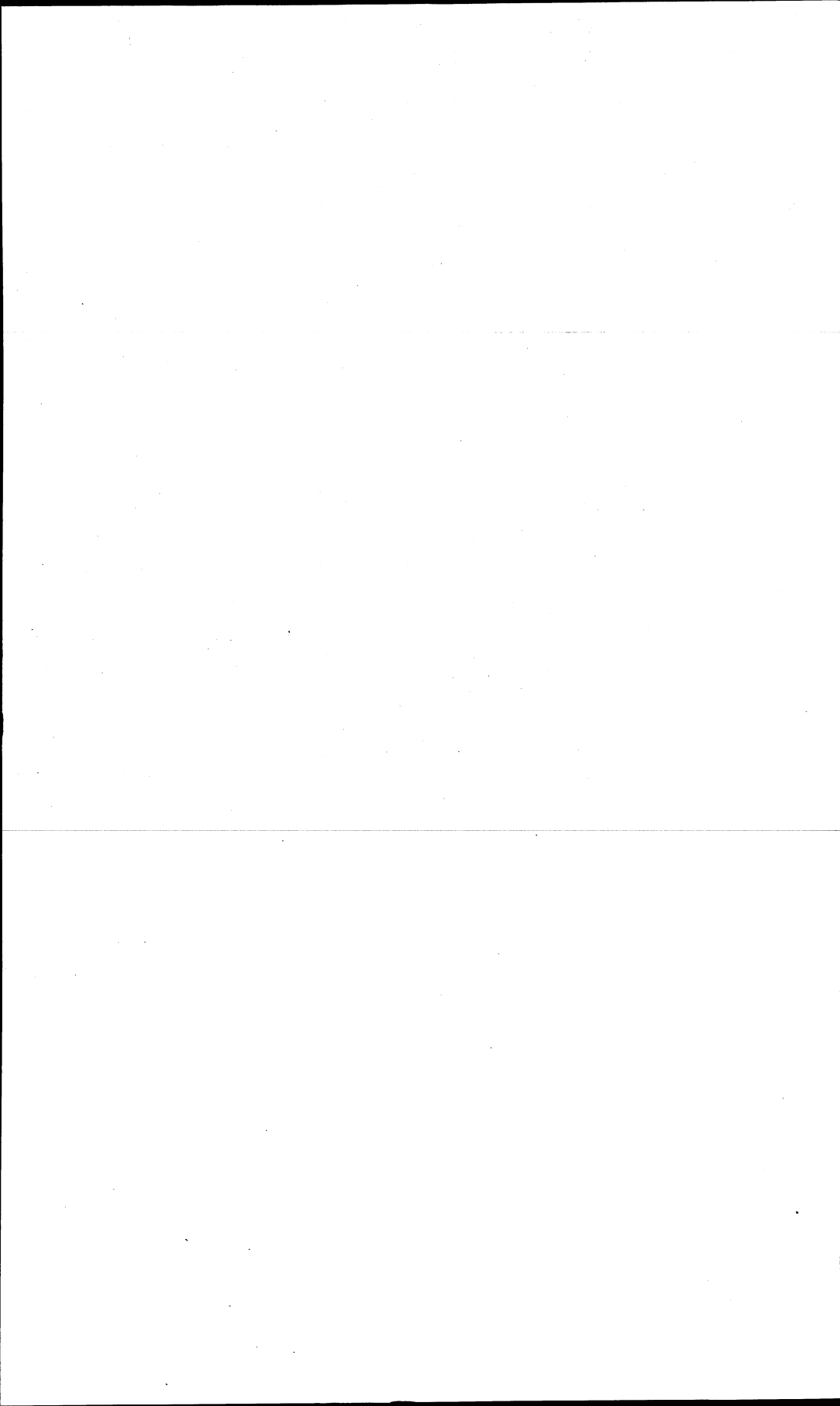
GEO. W. PECKHAM,
WM. H. HOBBS,
SAML. D. HASTINGS,
E. A. BIRGE.

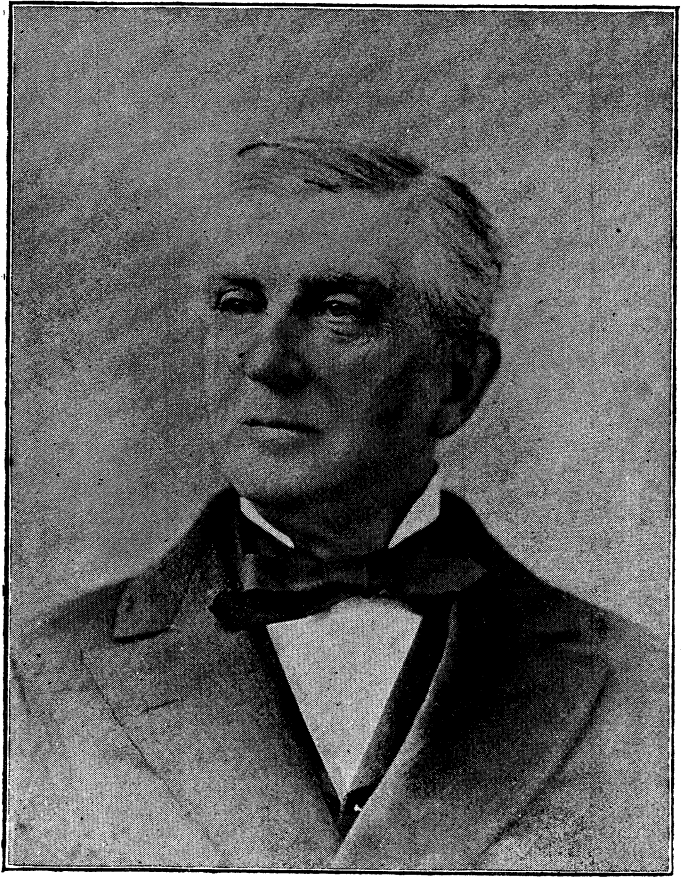
In Memoriam.

Aaron Lucius Chapin.

Philo Romayne Doy.







A. L. Chapman

AARON LUCIUS CHAPIN, D. D., LL. D.

(Late President of the Wisconsin Academy of Sciences, Arts and Letters.)

BY J. J. BLAISDELL.

Aaron Lucius Chapin, first president of Beloit college, was born in Hartford, Connecticut, February 6th, 1817. He was a son of Laertes and Laura Colton Chapin. His ancestors, on the side of both father and mother, were citizens of Connecticut, and were persons of robust intelligence and character. He received his academic education in the Hartford Grammar school and at Yale college, graduating at the latter institution in 1837. Among the members of his class were several gentlemen of national reputation, Rev. A. L. Stone, D. D.; Hon. Jeremiah Evarts, Chief Justice Morrison, R. Waite and Professor Benjamin Silliman being of the number. During the year subsequent to his leaving college, he was engaged in teaching a family school in Baltimore, Md., and from 1838 to 1843 he was a professor in the New York institution for the deaf and dumb. He studied theology while there engaged, and received his diploma at Union Theological Seminary in 1842.

The western states were at this time opening new fields for enterprise, not only in pursuits of ordinary industry, but in the christian ministry and in academical instruction. Mr. Chapin, under the appointment of the American Home Missionary Society, removed in 1844 to Milwaukee, where he became pastor of the First Presbyterian church. Here he remained six years. His pastorate in Milwaukee is spoken of as being one of great thoroughness and efficiency, and his friendship is affectionately cherished by not a few in that city, who were cognizant of his early ministry.

In February of 1850, Dr. Chapin was called from Milwaukee to Beloit college as its first president, and was inaugurated to the duties of that office July 24th, of the same year. Rev. Jack-

son J. Bushnell and Rev. Joseph Emerson, D. D., had just become professors of the new institution, and to Dr. Chapin in conjunction with these two professors, is in large measure due the determining of the wise principles and methods by which its administration has been rendered so eminently successful in the training of men.

Dr. Chapin was married to Miss Martha Colton, of Lenox, Mass., August 23, 1843. After her death he married, as his second wife, Miss Fannie L. Coit of New London, August 26th, 1861. He is father of four children. One of them, Elizabeth C., now the wife of Henry D. Porter, M. D., is a missionary of the American Board of Missions in Puang Chuang, China. His only son, Robert Coit Chapin, is his father's successor in the professorship of political economy in Beloit College. Two daughters, Annie L. and Ellen F., still remain since the father's death, with Mrs. Chapin and their brother, in the home at Beloit.

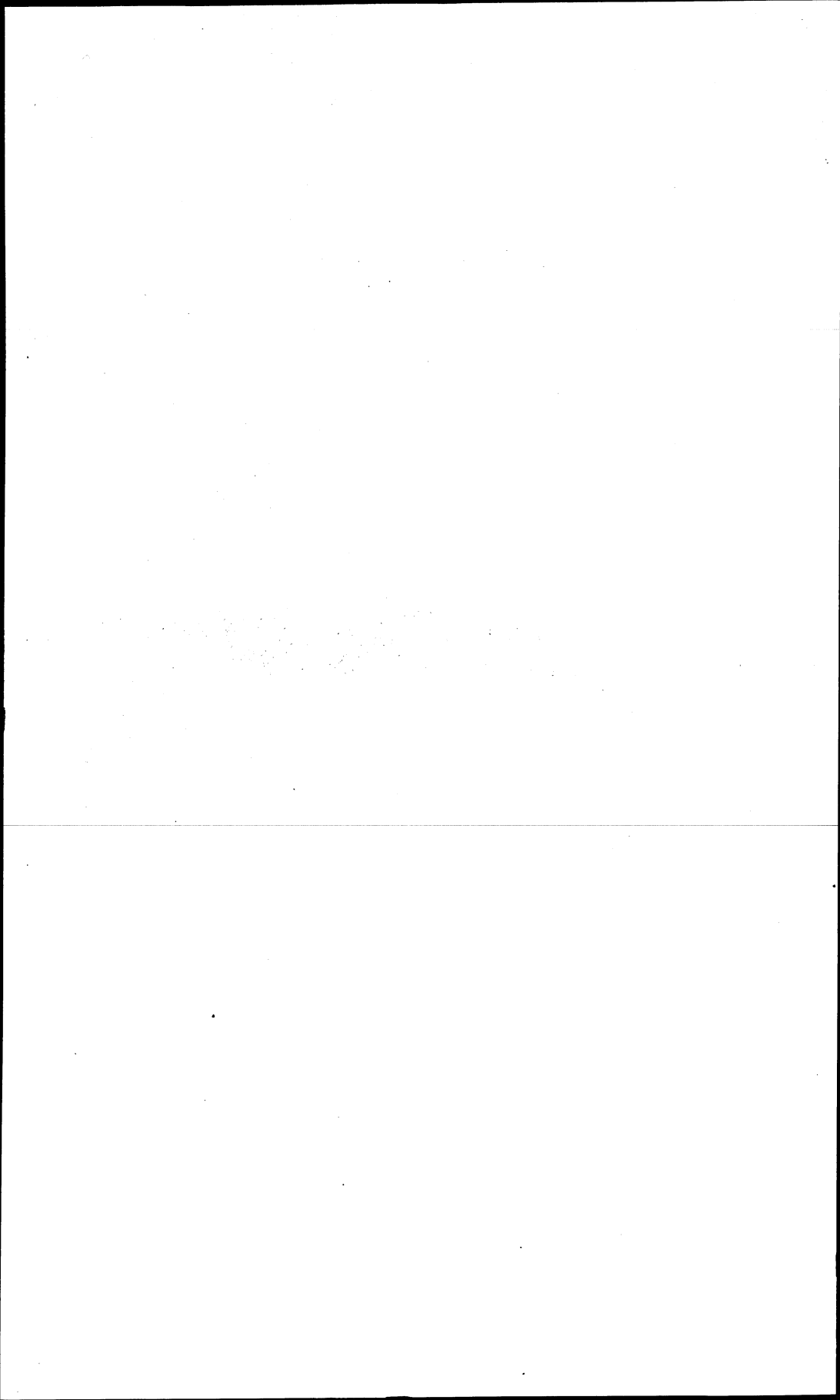
The degree of Doctor of Divinity was conferred on President Chapin by Williams college in 1853, and that of Doctor of Laws by the University of New York in 1882. He served the American Board of Commissioners for Foreign Missions as one of its corporate members, for many years. In 1884 he was appointed to preach the annual sermon. From an early period in its history he was one of the directors of the American Home Missionary Society. He was one of the vice-presidents of the American Missionary Association, president of the board of trustees of the State Institution for Deaf Mutes, an original trustee of Rockford Seminary, and one of the directors of the Chicago Theological Seminary. He was one of the board of examiners at the United States Naval Academy at Annapolis in 1872, and held the same position at West Point in 1873. His connection with the Wisconsin Academy of Sciences began with its origin in 1870; he has held the office of its president and in 1891 was made, because of eminent services and worth, a life member. Many valuable contributions from his pen are in its records. His connection with the whole interest of public instruction in Wisconsin, both direct and indirect, has been

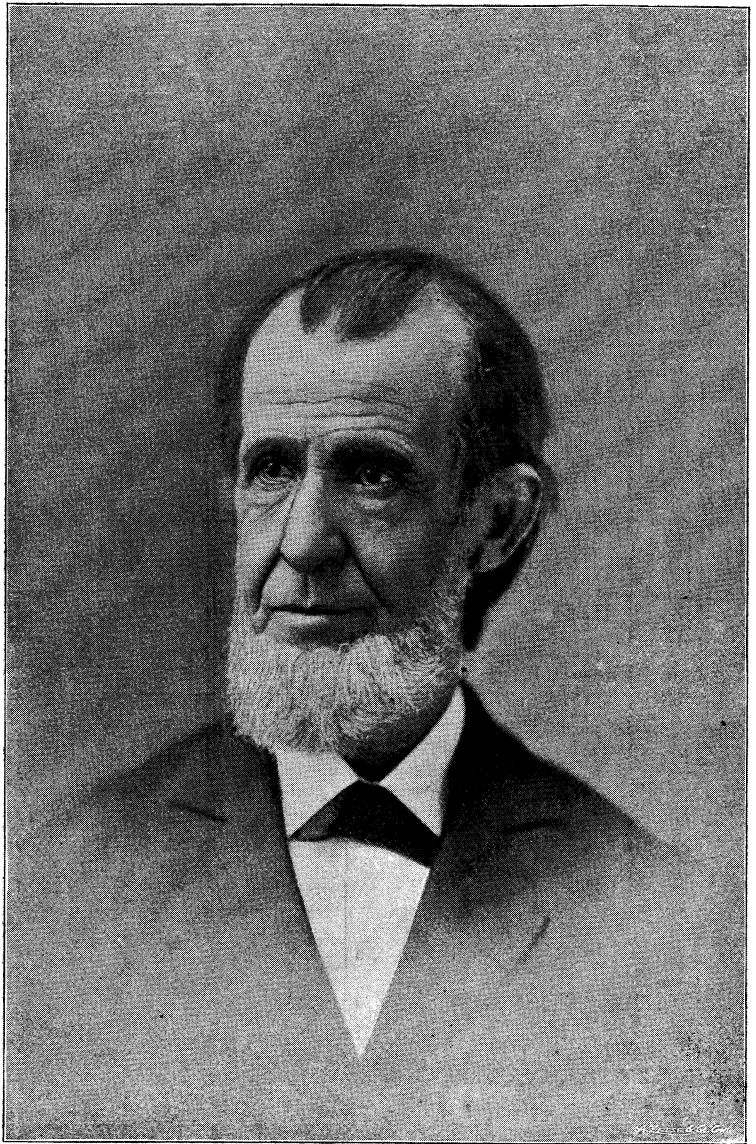
alike conservative and powerfully promotive of the best things. With an ever deepening interest in the cause of that education which is genuinely religious and christian, he did not withhold himself from any sacrifice, whether through the work of the college or outside its special function, which might make the life of the commonwealth and the nation free, intelligent, strong and true. In 1865, during a brief period of physical exhaustion, he passed several months in Europe, and again, in 1883, he visited the old world as member of a committee sent by the American Board to the Turkish Mission for the purpose of adjusting certain differences between the American churches and the missionaries of the Board.

In the midst of a busy life, Dr. Chapin found little leisure for the protracted labor of literary authorship. He gave to the press a few occasional sermons, addresses and reviews. In 1878 an edition of "Wayland's Political Economy" was issued under his supervision, in which the original work was recast and partly rewritten by him. A smaller work, as a text book in the same science, more completely his own production, was afterwards issued by him, which has been adopted as a text book in several schools and colleges, and is spoken of with honor.

Dr. Chapin resigned the presidency of the college at the annual commencement in 1886, his long labor causing him to feel the pressure of advancing years. He retained his connection with the institution as President Emeritus and Professor of Civil Polity for the remainder of his life. Soon after his more active services were surrendered, however, it became painfully manifest that the long strain of his unsparing devotion to all good interests had placed him beyond the probability of recuperation and continued good health. After a short period in the office of instruction his physical system suffered serious prostration. He still remained amid the scenes of his earlier labors, evincing rare interest in all the vital concerns of the college and of all good things far and near, his life mellowed and beautified with the rare enrichment as of serene sunset, loved and revered, as only the devoted servants of the good of men are, until his life on earth passed out, in his beautiful home, into the life which

it was his unsparing toil to open to the entrance of others. He died July 22, 1892. His resting place in the Beloit cemetery will suggest to the many pupils and others, who visit it in the coming years, little that will not emphasize the excellence, and help to create the ideal of christian science.





P. R. Hoy

PHILO ROMAYNE HOY, M. D.

[Late President of the Wisconsin Academy of Sciences, Arts and Letters.]

BY JOHN G. MCMYNN.

This eminent physician, surgeon, scientist and citizen was born in Mansfield, Ohio, November 3, 1816. The Hawey family [Hoy] is of Scotch origin, and history locates the clan on the Orkney Islands and in the northern part of the mainland. At the battle of Flodden, in 1613, so disastrous to the Scotch, William Hoy was taken prisoner and was *sold* [as the custom was] to an English family. Eloping with his master's daughter, they went to Ireland, and among their descendents were three brothers, who having become involved in difficulty with a public officer, escaped by taking refuge in a ship, about to convey some Scotch Covenanters to America in 1756.

From these brothers the Hoyes of this country are descended and among their descendents was Capt. William Hoy, the father of the subject of this sketch, who commanded a company of New York volunteers at the battle of Plattsburg. Soon after the close of the war of 1812, Capt. William Hoy, with his family, moved from Washington county, New York, to Mansfield, Ohio, where his son, Philo Romaine, was born, in the log house which his father built. His boyhood was spent amid the privations and hardships of pioneer life. He had the training that hard work imparts and thus possessed advantages of which so many young of the present time are deprived. The schools of half a century ago are called poor when compared with those of the present day, but this comparison will hardly hold when applied to the boys of then and now.

After obtaining the best education the schools of his native town afforded, young Hoy, at the age of twenty, commenced the study of medicine with Dr. Alexander McCoy, where he

prepared for his collegiate course, and graduated from the Ohio Medical School, at Cincinnati, in 1841. He commenced practice at New Haven, Ohio, where he remained until 1846, when with his wife and three-year-old boy, he came to Racine.

Coming to this state when it was a territory, he soon achieved marked success, and he continued the practice of his profession in Racine during forty-five years, or until the end of his life. As a physician and surgeon he combined professional learning with sound judgment, and thus secured the confidence of the community and commanded the respect of his professional brethren. His practice, during its earlier years, extended over a large part of the southeastern portion of the state, and storms and bad roads were not regarded when he heard duty call. Few men have worked so long and so usefully for a compensation so inadequate. Amid his professional work Dr. Hoy found time to discuss subjects and to deliver numerous addresses before medical societies, and the papers presented to the Wisconsin Academy of Sciences, Arts and Letters indicate wide reading and definite information. He was one of the founders of the Academy, and received its highest honors.

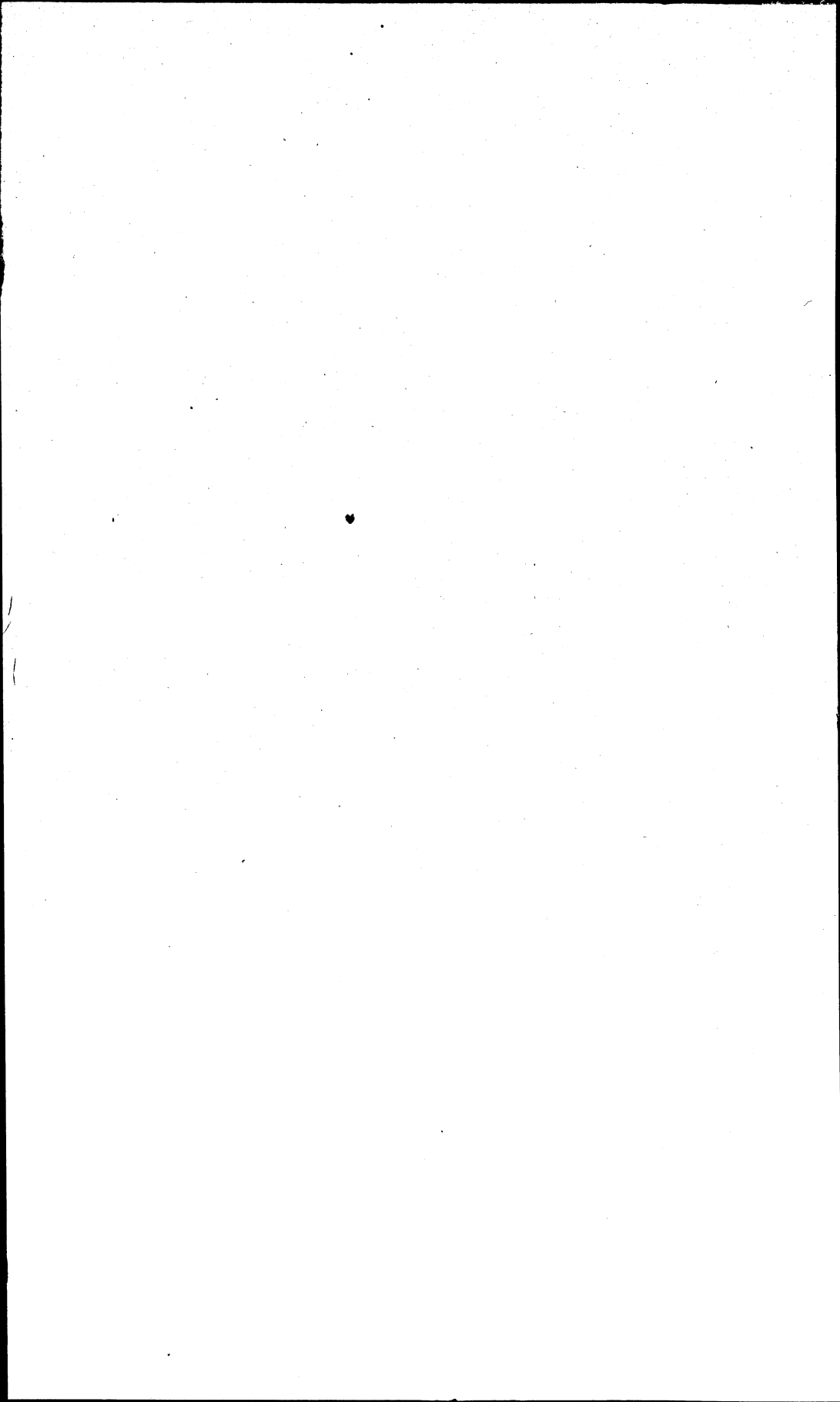
As a scientist Dr. Hoy was not a specialist; while many surpassed him in particular lines, few had studied the whole field more diligently than he. The section of the state in the vicinity of Racine affords special opportunities for the study of ornithology and some other branches of Natural History. His early acquaintance and life-long friendship with Dr. I. A. Lapham, to whom science owes so large a debt, served as a stimulus to study so congenial to both. The collection which he made, and which is now at Racine, was pronounced by Dr. Baird, some years ago, the largest local collection in the world. It has been visited and inspected by many of the noted scientists of the United States. His acquaintance with men engaged in the study of science was intimate, and his correspondence with such men as Henry, Agassiz, Baird, Kirtland, Cassin and many others of like pursuits, indicates their respect for his wide range of knowledge of nature. Dr. Hoy was also noted for a desire to disseminate the knowledge he possessed. He gave his time without limit to the instruction of teachers and students in

hygiene and especially in ventilation. He did much to promote the prosperity of Racine College and of the public schools of the city, and he was a firm and intelligent friend of the American common school system, believing that upon its proper development depends the perpetuity of the Republic.

Some of the aphorisms in which he condensed knowledge indicated the practical turn of his mind, such as: "Calisthenics is genteel, romping is rude, but the one is the shadow and the other is the substance that secures health." "Sunlight may brown the skin, but while it uproots the lily it plants the rose." "Dirt, debauchery, crime and disease are successive steps of one another." "Nature never suggests age to us; the grass, flowers, trees, insects and birds seem the same year after year."

From the time Dr. Hoy came to Wisconsin in 1846 until his sudden death, December 8, 1892, at his home, he lived in the same house. In 1842 he married Mary Elizabeth Austin, of Ripley, O., an accomplished lady and a noble woman, who presided over his home for thirty years, dying in 1872. They had three children, all of whom are living—Albert Harris, who is a successful physician and surgeon of Racine, Wis., Jenny Rebecca, who is now Mrs. William Henry Miller, of Racine, and Philo Romayne, an electrician, of Chicago, Ill.

Up to the day when Dr. Hoy ended his long, useful and honorable life, he was in the full possession of his mental faculties.



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 PROFESSOR R. D. IRVING, PH. D.,* 1881-84.
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*Deceased.

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- Caverno, Rev. Charles, Lombard, Ill.
Crooker, Rev. J. H., Helena, Montana.
- Davis, Floyd, Socorro, N. M.
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- Ebenezer, F., Ph. D., Baltimore, Md.
- Fallows, Right Rev. Bishop Samuel, Chic go, Ill.
Fiske, E. O., Minneapolis, Minn.
- Gilman, D. C., Ph. D., LL. D., President Johns Hopkins University,
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- Harris, W. T., LL. D., Concord, Mass.
Higley, W. K., Secretary Chicago Acad. of Sciences, Chicago, Ill.
Hodge, Dr. C. F., Clark University, Worcester, Mass.
Holden, Prof. E. S., Director Lick Observatory., Mt. Hamilton,
Cal.
Holland, Rev F. M., Concord, Mass.
Hopkins, F. N., M. D., Baton Rouge, La.
Horr, M. D., President Iowa Inst. Arts and Sciences, Dubuque
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Hoskins, Prof. L. M., Stanford University, Palo Alto, Cal.
Hubbell, H. P., Winona, Minn.
- Jewell, J. S., A. M., M. D., Prof. Chicago Medical College, Chicago
Ill.
- Leverett, Frank, F. G. S. A., 4103 Grand Boulevard, Chicago, Ill.
Le Barron, William, State Entomologist, Geneva, N. Y.
Litton, Prof. Robt. T., Secretary Geological Society of Australasia,
45 Queen St., Melbourne, Victoria.
Luther, Geo. E., Mich. Trust Co., Grand Rapids, Mich.

Marcy, Oliver, LL. D., Prof. Northwestern University, Evanston, Ill.

Marx, Prof. C. D., Stanford University, Palo Alto, Cal.

Morgan, L. H., LL. D., Rochester, Ill.

Orton, Prof. E., A. M., Professor in State University, and State Geologist, Columbus, Ohio.

Paine, Alford, S. T. D., Hinsdale, Ill.

Peet, Rev., Stephen D., Ph. D., Avon, Ill.

Potter, Prof. W. B., Washington University, St. Louis, Mo.

Power, Prof. F. B., Passaic, N. J.

Safford, Prof. T. H., Williams College, Williamstown, Mass.

Salisbury, Prof. R. D., University of Chicago, Chicago, Ill.

Sawyer, Prof. W. C., ————.

Schaler, Prof. N. S., A. M., Harvard University, Cambridge, Mass.

Shipman, Col. S. V., Chicago, Ill.

Somers, Rev. A. N., La Porte, Ind.

Steele, Rev. G. M., Principal Wilbraham Seminary, Wilbraham, Mass.

Stump, Prof. J. W., Oswego, N. Y.

Tatlock, John, Jr., Mutual Life Insurance Co., New York, N. Y.

Townley, S. D., M. S. University of Michigan, Ann Arbor, Mich.

Trelease, Prof. William, Washington University, St. Louis, Mo.

Trumbull, J. H., LL. D., Hartford, Ct.

Van de Warker, Eli, M. D., Syracuse, N. Y.

Verrill, Prof. A. E., A. M., Yale University, New Haven, Ct.

Whitman, Prof. C. O., University of Chicago, Chicago, Ill.

Whitney, Prof. W. D., Yale University, New Haven, Ct.

Winchell, Prof. N. H., State Geologist, Minneapolis, Minn.

Young, Rev. A. A., Monona, Iowa.

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NOTE—The above list probably contains errors. Notice of corrections should be sent to the secretary.

ACTIVE MEMBERS.

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Barnes, Prof. C. R., Madison.

Balg, Prof. G. H., Milwaukee.

Beach, Prof. W. H., Milwaukee.

Baetz, Hon. Henry, Milwaukee.

Blackstone, Prof. D. P., Berlin.

Blake, Prof. W. P., Shullsburg, Wis.

Blaisdell, Prof. J. J., Beloit.

Buell, Ira M., Beloit.

Butler, Prof. J. D., Madison.

Brown, E. A., M. D., Madison.

Cheney, Prof. L. S., Madison.

Chapman, Prof. C. H., State Normal School, Milwaukee.

Chandler, Prof. C. H., Ripon.

Chandler, Hon. W. H., Sun Prairie.

Comstock, Prof. Geo. C., Madison.

Conover, Mrs. Sarah F., Madison.

Culver, Prof. G. E., Beloit.

Daniells, Prof. W. W., Madison.

Davis, Dr. J. J., Racine.

Dawley, Prof. J. H., Antigo.

Desmond, Hon. H. J., Milwaukee.

Doyle, Hon. Peter, Milwaukee.

Eckels, Prof. W. A., Ripon.

Ely, Prof. R. T., Madison.

Flagg, Rev. Rufus C., Ripon.

Foye, Prof. J. C., Appleton.

Frankenburger, Prof. D. B., Madison.

Fuller, Prof. N. S., Ripon.

Greene, Thos. A., Milwaukee.

Gordon, Mrs. Geo., Milwaukee.

Harrison, Caleb H., Milwaukee.

Haskins, Prof. C. H., Madison.

Hastings, Hon. S. D., Madison.

Hendrickson, Prof. G. L., Madison.

Henry, Prof. W. A., Madison.

Hillyer, Prof. H. W., Madison.

Hobbs, Prof. Wm H. Madison.
Hodge, Willard, Chippewa Falls.
Hollister, A. H., Madison.
Hubbard, Prof. F. G., Madison.

Jackson, Prof. D. C., Madison.
Jastrow, Prof. Joseph, Madison.

Kahlenburg, Prof. Louis, Madison.
Kerr, Prof. Alexander, Madison.
King, Prof. F. H., Madison.
Kinley, Dr. David, Madison
Kremers, Prof Edward, Madison.

Lamb, F. J., Madison.
Leavenworth, Prof. W. S., Ripon.
Loomis, Prof H. B., Madison.

Marks, Dr. Solon, Milwaukee.
Marsh, Prof. C. Dwight, Ripon.
Meacham, Dr. J. G., Sr., Racine.
Meacham, Dr J. G., Jr., Racine.
Merrill, Miss H. B., Milwaukee.
Miller, Dr. W. S., Madison
Mills, Hon. Simeon, Madison.
Moorehouse, G. W., Milwaukee.
Morris, W. A. P., Madison.

Nader, Capt. John, Madison.
Norton, R. G., Madison.
Noyes, Hon. G. H., Milwaukee.

Orton, Hon. H. S., Madison.

Parker, Prof. W. D., Madison.
Parker, Prof. F. A., Madison.
Puls, A. J., Milwaukee.
Pudor, Prof. C. C., Madison.

Rogers, Prof. A. J., Milwaukee.

Sanford, A. H., Madison.
Schneiding, Henry E., Racine.
Scott, Prof. W. A., Madison.
Sennott, Chas. P., Milwaukee.
Skinner, Prof. E. B., Madison.
Smith, Prof. E. G , Beloit.
Sprague, A. R., Milwaukee.
Stuart, J. R., Madison.

Thwaites, R. G., Madison.
Turner, Prof. F. J., Madison.
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Van Cleef, Prof. F. L., Madison.
Van Hise, Prof. C. R., Madison.
Van Velzer, Prof. C. A., Madison.
Viebahn, Prof. C. F., Watertown.

Wheeler, Prof. W. M., Milwaukee.
Wright, Prof. A. O., Madison.

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NOTE.—Members will accommodate the secretary by promptly informing him of any errors or omissions in the above list.

DECEASED MEMBERS.

Allen, Hon. W. C., Racine.
Allen, Wm. F., Prof. of History, University of Wisconsin. [President of Wisconsin Academy, 1887-1889.]
Armitage, W. E., Right Rev. Bishop, P. E. Church, Milwaukee.
Carpenter, S. H., LL. D., Prof. of English Language, University of Wisconsin.
Case, Hon. J. I., Racine.
Chapin, Dr. A. L., President of Beloit College, Beloit. [President of Wisconsin Academy, 1878-1881.]
Conover, O. M., LL. D., Madison.
Copeland, Prof. H. E., Whitewater.
De Koven, S. T. D., Warden Racine College, Racine.
Dewey, Gov. Nelson, Madison.
Draper, Dr. L. C., Madison.
Dudley, Wm., Madison,
Durrie, D. S., Librarian Wisconsin State Historical Society, Madison.
Eaton, J. H., Ph. D., Prof. of Chemistry, Beloit College, Beloit.
Engleman, Prof. Peter, Director German and English Academy, Milwaukee.

Feuling, J. B., Ph. D., Prof. of Philology, University of Wisconsin.
Foster, J. W., LL. D., Prof. University of Chicago, Chicago.
Freer, J. C., President Rush Medical College, Chicago.

Hawley, C. T., Milwaukee.

Heritage, Lucius, Prof. of Latin, University of Wisconsin.

Holton, Hon. E. D. Milwaukee.

Hoy, Dr. P. R., Racine, Wis. [President of Wisconsin Academy,
1876-1878.]

Irving, R. D., E. M., Ph. D., Prof of Geology, University of Wisconsin,
and U. S. Geologist. [President of Wisconsin Academy,
1881-1884.]

Knapp, Hon. J. G., Milwaukee.

Kumlein, Prof. Thure, Albion College, Albion.

Lapham, I. A., LL. D. State Geologist, Milwaukee.

Lawler, Hon. John, Prairie du Chien, Wis.

Lewis, Mrs. H. M., Madison.

Little, Thomas H., Supt. Institution for the Blind, Janesville.

McDill, A. S., M. D., Supt. State Hospital for the Insane, Madison.

Newberry, Dr. J. S., Columbia College, N. Y.

Nicodemus, W. J. L., A. M., C. E., Prof. of Engineering, University
of Wisconsin.

Oldenhage, Prof. H. F., Milwaukee High School, Milwaukee.

Paul, Hon. Geo. H., Milwaukee.

Pradt, Rev J. B., A. M., Madison.

Reid, Hon George, Manitowoc.

Smith, Hon. John Y., Madison.

Smith, Hon. Wm. E., Milwaukee.

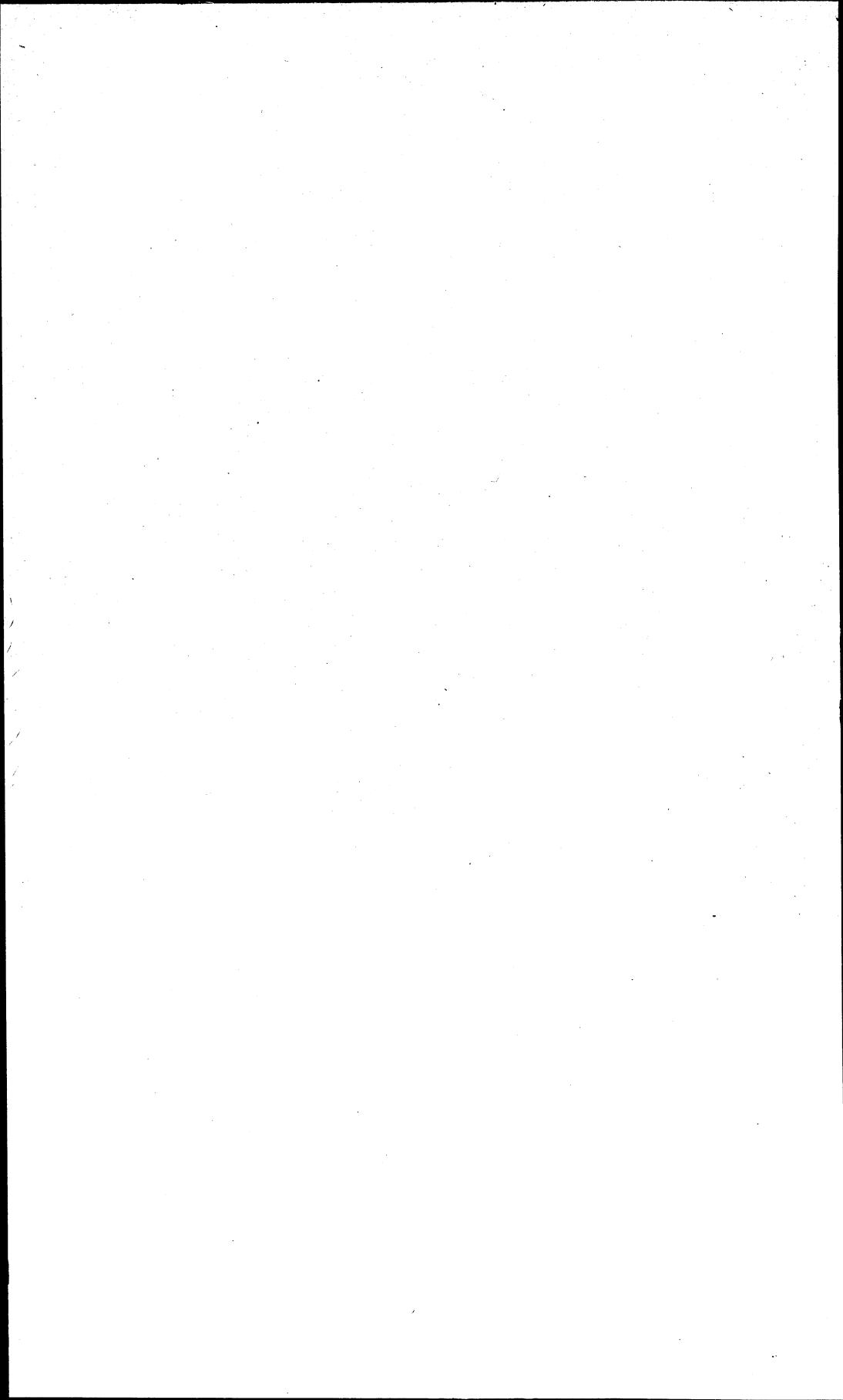
Stimpson, Wm., M. D., Secretary Chicago Academy of Sciences,
Chicago. .

White, Hon. S. A., Whitewater.

Winchell, Prof. Alexander, University of Michigan, Ann Arbor,
Mich.

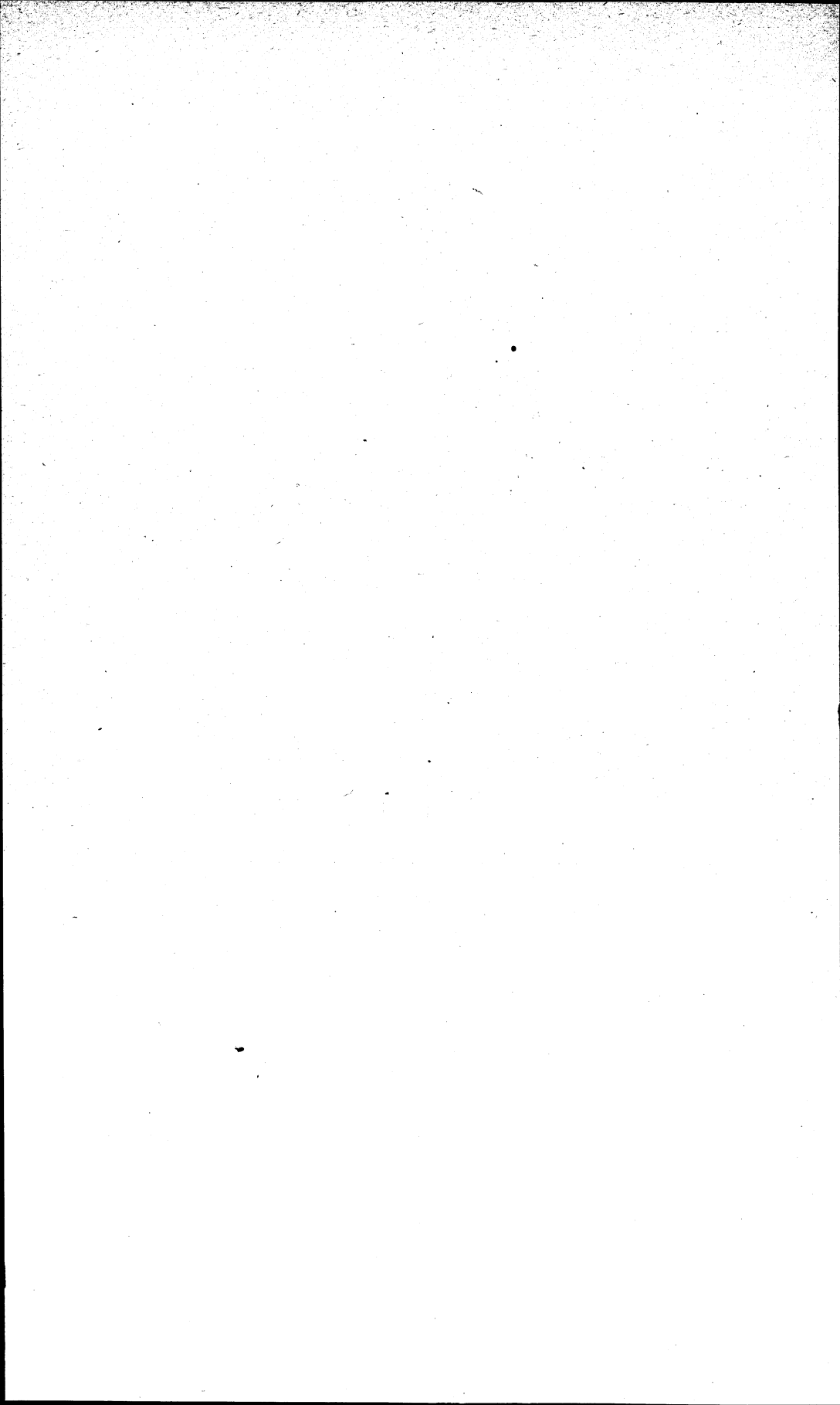
Wolcott, E. B., M. D., Surgeon General, Milwaukee.

APPENDIX.



CATALOG OF THE LIBRARY
OF THE
WISCONSIN ACADEMY
OF
SCIENCES, ARTS, AND LETTERS,

1893.



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NOTE.

The following catalog has been printed from a card catalog of the books of the library, prepared by the librarian, with the clerical assistance at different times of gentlemen connected with the University of Wisconsin.

A shelf catalog seemed on the whole best adapted to the library in its present condition, and has been adopted. The bulk of the library consists of a series of scientific journals, received in exchange for the Transactions of the Academy. These are cataloged alphabetically, according to the cities from which the journals are issued. The number and letter placed after each series locates the books of that series in a definite case (numbered), and on a definite shelf (lettered) of the library room. A plus sign following the volume numbers indicates that current issues of the journal are received as exchanges.

Following the general list of journals is an alphabetical-classed catalog in which are included all journals, non-serial volumes and pamphlets of a special character, arranged under their respective subjects. Under each special subject of this portion of the catalog is given, first, journals, arranged alphabetically according to place of issue; and, second, non-serial publications (whether volume or pamphlet) in alphabetical sequence, according to author. These journals are likewise included in the general list of journals in the first section of the catalog. If a publication is a book of considerable size, a number and letter following its entry will indicate its location on a shelf of the library. The pamphlets treating a given subject are placed together on the shelves, arranged alphabetically according to authors, and conveniently separated by stiff boards, bearing the initial letters of the authors' names. Hence a single reference to location at the head of each subject suffices for the pamphlets.

The valuable inaugural dissertations of European universities have been distributed like other pamphlets in the subject catalog. They will therefore be found in the catalog by considering

the subject treated and the author, instead of the university and the year of publication. When a pamphlet treats of more than one subject, it has generally been indexed under each subject which it treats.

This form of catalog will, it is thought, be all that is necessary for the present to make the matter in the library easily accessible, and the system is flexible enough to be easily adjusted to a more elaborate system, when the increased size of the library shall make such a system necessary or desirable.

The preparation of this catalog has consumed a great deal of time, owing to the confusion in which the books have hitherto been, and as the work has been often interrupted it has extended over more than two years. It thus happens that in many cases the later accessions of a series are not entered in the catalog. The work has been "a labor of love," and has been undertaken in order to increase the library facilities of Madison by a considerable collection of valuable books, otherwise of but little use. I have received much assistance from Professor L. S. Cheney, of the University of Wisconsin. Professors F. L. Van Cleef, G. L. Hendrickson and J. E. Olsen have also assisted me in the classification of dissertations printed in the classical and Scandinavian languages.

WM. H. HOBBS.

MADISON, Wis., August 10th, 1893.

CATALOG.

- AARGAU [Germany] Aargauische Naturforschende Gesellschaft.
Mittheilungen Hft. VI. + 19d
- ALBANY [New York] University of State of New York.
Annual Report of Regents 1872, 74-85, 87-90, + 23d
Extension Bulletin No. 1. + 23e
Regents' Bulletin, June, 1890, to Sept., 1891.
Nos. 1-7. + 23e
- New York State Library.
Annual Reports, '54-59, 62-66, 70-73, 91. + 23c
State Library Bulletin. 23e
Additions No. I, 1891. 23e
Library School No. I, 1891. 23e
Legislation Nos. II and III, 1892, '93. + 23e
- Museum of Natural History.
Annual Reports, 1872, 74, 75-91; 20, 21-31,
33-37, 40-43, 44. 23c
Bulletin, Vols. I (Nos. 1-6), II (Nos. 7-10). 23c
- Dudley Observatory.
Annals 1862-71, Vol. II. 20c
- AMIENS [France] Societe Linneenne du Nord de la France
Bulletin. Vols. I, Nos. 31-42; III, Nos. 49-54,
58-66; IV, Nos. 67-78, 88-90; V, VI, VIII,
Nos. 175-186; IX, X. + 9a
Memoires. Vols. V, VI, VIII. + 9a
- AMSTERDAM [Holland] Koninklijke Akademie van Wetten-
schappen.
Jaarboek, 1873-75, 81-83, 88-90. 25b

- AMSTERDAM [Holland] Koninklijke Akademie van Wetenschappen. (Continued.)
 Verslagen en Mededeelingen.
 Afd. Naturkunde.
 2d series, Vols. I-XX. + 25b.c
 3d series, Vols. I-VIII. + 25b.c
 Afd. Letterkunde.
 2d series, Vols. I, V-VII, XI, XII. 25b
 Processen Verbaal van de Gewone Vergaderingen.
 1873-1876, 1881, 1883. + 25b
 Verhandelingen.
 Afd. Naturkunde, Vols. XIV-XVI, XXIII,
 XXVII, XXVIII. 27e
 Afd. Letterkunde. Vols. VIII, X, XIV,
 XVIII, XIX. + 27e
 Verslagen en Mededeelingen.
 Afd. Naturkunde.
 2d series, Vol. XI. + 25b
 3d series, Vol. I. 25b
- Koninklijk Zoologisch Genootschap Natura Artis
 Magistra.
 Feest Nummer. Bijdragen tot de Dierkunde. 22c
- ANN ARBOR [Michigan] Engineering Society of Ann Arbor.
 The Technic, 1891, 1892. + 20b
- ANTWERP [Belgium] Societe royale de Geographie d'Anvers.
 Bulletin, Vol. XVI fasc. 4; XVII fasc. 1. + 13
 Le Colorado par M. A. de Ceuleneer. 13
- AUGSBURG [Germany] Naturhistorischer Verein in Augsburg.
 Berichte, 26-28. 11a
- Naturhistorischer Verein für Schwaben u. Neuburg (a.
 V.) in Augsburg (Formerly Naturalhist. Verein
 in Augsburg.)
 Berichte, 29-30. + 11a

Journals.

7

- AUGUSTA [Maine] Geology of the State of Maine.
 Report, 1838, 1839. **15a**
 Report of Secretary of Maine Board of Agriculture
 (Annual), 1861, 1862. (Contains Geologist's Report.) **15d**
-
- AUSTIN [Texas] Geological Survey of Texas.
 Annual Reports, I, II and III. + **15d**
 Bulletin 1. **15d**
- Texas Academy of Science.
 Transactions. Vol. I, No. 1 (1892). + **19d**
- BADEN [Germany] Badischer Botanische Verein.
 Mittheilungen, Nos. 95-102. + **22e**
- BALTIMORE [Maryland] Johns Hopkins University.
 Register for 1890-91, 1891-92. + **26b**
 Circulars. Vols. I, Nos. 15, 17; II, 19; III, 28-30;
 IV, 39-42; V, 43, 45-47, 51; VI-XI. + **26a**
- BAMBERG [Germany] Naturforschende Gesellschaft in Bamberg.
 Bericht, XV. + **5d**
-
- BARCELONA [Spain] Real Academia de Ciencias y Artes de Barcelona.
 Boletin, 3d series. Vol. I, parts 1-3. + **1a**
 "Acta de la Sesion Inaugural de los Trabajos de la Corporacion." **1a**
 "Legis Cosmicos segun el Priscipio Dulainico del Calor." **1a**
 Memoria Inaugural par D. Lauro Clariana y Ricart." + **1a**
-
- BASEL AND GENEVA [Switzerland] Schweizerische Botanische Gesellschaft.
 Berichte. Hft. 1 (1891). + **22c**
22c
- BASEL [Switzerland] Naturforschende Gesellschaft.
 Verhandlungen. Vols. VI, VII, h. 3; VIII, h., 1, 3;
 IX, h. 1, 2. + **6d**

- BATAVIA [Java] Koninklijke Natuurkundige Vereeniging
in Nederlandsch-Indie. 11b
Natuurkundige Tijdschrift voor Nederlandsch-Indie. Vols. XXXV-XXXIX, XLI, XLIV-XLVIII, L. 11b
- BELFAST [Ireland] Natural History and Philosophical Society.
Report and Proceedings, 1890, 91, 92. + 2a
- BERGAMO [Italy] Ateneo di Scienze, Lettere ed Arti.
Atti. Vol. X, parts 1, 2. + 19e
- BERGEN [Norway] Bergen Museum.
Aarsberetning. 1886-89. + 27b
- BERKELEY [California] University of California Agricultural Experiment Station.
Bulletin No. 100. + 28b
- BERLIN [Germany] Zeitschrift der gesammten Naturwissenschaften.
2te Folge. Vols. IX-XIV. 5a
—Zeitschrift f. Praktische Geologie [Edited by Max Krahnemann, Wetzlar, Rheinprovinz] 1893, Hfts. 1-8. + 13d
—Zeitschrift fur Instrumentenkunde.
Vol. XIII, Nos. 1 and 2. + 13e
—Gesellschaft Naturforschende Freunde.
Sitzungsberichte. 1892, No. 9; 1893, No. 1. + 19e
—Deutsche Geologische Gesellschaft.
Zeitschrift, Vols. XXIV-XLIV. + 14c d
—Gesellschaft fur Erdkunde.
Zeitschrift, Vol. XXVII, parts 1-4. + 19a
Verhandlungen, Vol. XIX, parts 1-10. + 19a
- BERNE [Switzerland] Schweizerische Naturforschende Gesellschaft.
Verhandlungen, 1869, 1872-90. + 12b

Journals.

9

- Naturforschende Gesellschaft in Berne.
Mittheil., 1869, 1870-1890. + 6c
- BOLOGNA [Italy] Congres Geologique International.
Comptes Rendus, 2d session, Bologne, 1881. 14a
- Istituto di Bologna.
Rendiconto delle sessioni della R. Accademia
delle Science, 1889-90. + 9d
- BONE [Algiers] Academie d'Hippone.
Bulletin, XXII, XXIII, 1-4; XXIV. 11b
Comptes Rendus, 1888, 89, 90, 91. + 11b
- BONN [Germany] Naturhistorischer Verein d. preussischen
Rheinlande und Westfalens.
Verhandlungen, Vols. XXVII, XXXII-XXXVIII.
(1870, 75-81.) 31d
- Naturhistorischer Verein der preussischen Rhein-
lande, Westfalens u. d. R-B. Osnabruck.
(New Series.)
Verhandlungen, Vol. XLVIII, Hft. 2; XLIX,
Hft. 1. + 31d
- Niederrheinische Gesellschaft fur Natur- und Heil-
kunde in Bonn.
Sitzungsberichte, Vols. XXXIV-XXXVI,
XXXVIII. (Without title pages and tables
of contents.) 7a
- BORDEAUX [France] Academie Imperiale des Sciences,
Belles Lettres et Arts.
Actes, 1867, 3 trimestre; 1872-3, 1878, 1880,
1882-83, 1884-89. + 1b
- Societe Linneenne de Bordeaux.
Proces- Verbaux, Vol. XLV. + 31d
- BOSTON [Massachusetts] Boston Society of Natural History.
Proceedings, Vols. XVII, XVIII, XIX, pts. 1, 2
and 4; XX, XXI, pts. 1-3; XXII, pts. 3
and 4; XXIII, pts. 1-4; XXIV, pts. 1-4;
XXV, pts. 1-4. + 5b

- Boston Journal of Chemistry. Vols. XII, Nos. 1-11, 15-17; XIII, 1, 3-5, 8, 9; XIV, 1, 4, 5, 7, 8, 10-12; XV, 1, 3-6, 8, 12; XVI, XVII, 1-3. 30c
- American Academy of Arts and Sciences.
 Proceedings (N. S.), Vols. I-IV, VII-XVIII. + 2e
 Memoirs, Vol. XI, part 1. + 2e
- Agricultural Experiment Station.
 Bulletin, Nos. 38-40. + 28c
 Analysis of Commercial Fertilizers, Nos. 743-766. + 28c
- Massachusetts Institute of Technology.
 Proceedings of Society of Arts, 1880-90. + 20b
 Technology Quarterly, Vols. I, Nos. 2-4; II, 1-4; III, IV, V, 1-2. + 20b
- BRAUNSCHWEIG [Germany] Verein für Naturwissenschaft.
 Jahresberichte, 1, 3-6. + 10a
- BREMEN [Germany] Naturwissenschaftlicher Verein.
 Abhandlungen, Vols. I-XI, XII, Hft. 1, 2. + 6d
 Beilage, Nos. 1-8. + 6d
- BRESCIA [Italy] Commentari dell'Ateneo di Brescia.
 Anno 1891. + 27e
- BRESLAU [Germany] Zeitschrift für Entomologie.
 Neue Folge, Hfts. 1-17 (1870-92). + 31d
 Entomologische Miscellany. 31d
- Schlesische Gesellschaft für Vaterländische Cultur.
 Jahresberichte, Nos. 51, 53-59, 61-69. + 31e
 Abhandlungen, 1873-74. + 31e
 Fortsetzung des Verzeichnisses der in den Schriften der Gesellschaft von 1864-1876 enthaltenen Aufsätze geordnet den Verfassern in alph. Folge. 31e
- BROOKVILLE [Indiana] Indiana Academy of Science.
 Proceedings 1891. + 19e

Journals.

11

- BRUNN [Germany] Naturforschender Verein.
Bericht der Meteorologischen Commission, 1882-
1887, 1889. + 8b
Verhandlungen, Vols. XII, XIII, XVII, XVIII,
XIX, XXII, pts. 1 and 2; XXIII, pts. 1
and 2; XXIV, pts. 1 and 2; XXV-XXIX. + 8b
Katalog der Bibliothek. 8b
- BRUSSELS [Belgium] Societe Belge de Microscopie.
Bulletin, Annee XVIII, Nos. 1, 3-10, 11. + 12c
- Societe Royale Malacologique de Belgique.
Annales, Vols. XXI-XXV. + 22a
Proces-Verbaux des Seances, Vols. XI, pts. 1-7;
XII, pts. 8-12; XIII, XIV, XV, pts. 8-12;
XVI-XIX, XX, pts. 1-6. + 25a
- BUDAPEST [Hungary] Hungarian Geological Society.
(Foldtani Kozlony.)
Journal, Vol. XXII, pts. 11, 12. + 14a
- Hungarian Geographical Society (Foldrajzi Kozle-
menjek), Vol. XX, Nos. 1-8 (1892.) + 13a
- Statistisches Bureau der Hauptstadt Budapest. (Fo-
varos Statistikai Hivatalauk Kozlemenyei).
Vols. XXI-XXIV. 24b
- FERMESZETRAJZI FUZETEK.
(A periodical devoted to zoology, botany and ge-
ology, edited by the Hungarian National
Museum at Budapest, Vol. XV (1892), Nos.
3 and 4. + 19b
- BUENOS AYRES [Argentine Republic] Annuaire Statis-
tique de la Province de Buenos Aires.
Annee 8. + 27d
- Museo Nacional de Buenos Aires.
Anales, Vol. III, pts. 7-10. 4e
- Oficina Meteorologica Argentina.
Anales, Vol. I. + 20e

- BUFFALO** [New York] Buffalo Society of Natural Sciences.
Bulletin, Vols. I, Nos. 2-4; II, 1-3. **12b**
- CAEN** [France] Academie Nationale des Sciences, Arts,
et Belles Lettres.
Memoires, 1870-77, 85, 92. + **10c**
- CAIRO** [Egypt] Institut Egyptien.
Bulletin, 3d series, Nos. I, II, III, fasc. 1-2. + **1c**
- CALCUTTA** [India] Asiatic Society of Bengal.
Journal, Vol. XLI, Part ii, Nos. 1-2. + **1c**
- CAMBRIDGE** [Massachusetts] Library of Harvard University.
Bibliographical Contributions, Nos. 8, 12, 17, 19,
22, 26, 29, 30, 33-35, 37-45. **24b**
- Nuttall Ornithological Club.
Journal, Vol. IV, January, 1879. **22a**
- Museum of Comparative Zoology.
Annual Report of Curator, 1878-79, 80-91. + **4d**
Annual Report of Trustees, 1874, 1875. + **4d**
Bulletin, Vols. I, 1-6, 9-11; II, 2, 4-5; III, 9,
11-16; IV, pts. i, ii; V, 1-2, 8, 10-16; VI-
X, XI, 1-2, 4-11; XII-XV, XVI, 1-10;
XVII-XXIII, 1-3, 5. **4d**
Memoirs, Vols. I, II, 9, III (except pt. iv), IV, V,
2; VI, 1-2; VII, 1-2 pts. ii and iii; IX, 1-3;
X, 1-4; XIV, 1 pts. i, ii; XV, XVI, 1-3;
XVII, 1-2. + **4d**
- CARDIFF** [Wales] Cardiff Naturalists Society.
Report and Transactions, Vol. XXIV (1891-2). + **14a**
- CATANIA** [Italy] Accademia Gioenia di Scienze Naturali in
Catania.
Atti, Series 3, Vols. XVIII, XX; Series 4,
Vols. I-V. + **4e**
Bolletino Mensile, Fasc. 1-31. + **4e**

CHAMPAIGN [Illinois] Illinois State Laboratory of Natural History.	
Bulletin, Vols. I, Nos. 5 and 6; II, Arts. 3-8;	
III, Arts. 1, 2, 4-12; IV, Art. 1. +	4a
Biennial Report of Director. +	4a
—University of Illinois.	
The Technograph, 1890 and 1891. +	20a
—Civil Engineers' Club of the University of Illinois.	
Selected Papers, 1887 and 1888. +	20a
CHAPEL HILL [North Carolina] The Elisha Mitchell Scientific Society.	
Journal, Vols. IV-VII, VIII, pts. 1, 2. +	4a
CHERBOURG [France] Societe Nationale des Sciences Naturelles et Mathematiques de Cherbourg.	
Vol. XXVIII. +	19e
CHICAGO [Illinois] Association of Engineering Societies.	
Journal (Transactions and Proceedings), Vols. I,	
Nos. 5-12; II-VI, VII, 1-6, 9-12; VIII-X,	
XI, 1-12. +	20a
CHRISTIANIA [Norway] Norske Gradmaalingskommission.	
Vandstandsobservationer, Hfts. I, III, IV.	20e
—Norwegische Commission der Europäischen Gradmessung.	
Geodatische Arbeiten, Hfts. 1-4.	20e
—The Norwegian North-Atlantic Expedition, 1876-78.	
Historical Account	In case under 5
The Apparatus and how used—Wille.	"
Astronomical Observations—Mohn.	"
Magnetic Observations—Wille.	"
Geography and Natural History—Mohn.	"
Chemistry—Tornpe:	"
I. On the Air in Sea-water.	"
II. On the Carbonic Acid in Sea-water.	"
III. On the Amount of Salt in the Water of the Norwegian Sea.	"

CHRISTIANIA [Norway] The Norwegian North-Atlantic Expedition, 1876-78.—Continued.

Chemistry—Schmelck:

I. On the Solid Matter in Sea-water. In case und 5

II. On Oceanic Deposits. “

The North Ocean, Its Depth, Temperature and Circulation—Mohn. “

Meteorology—Mohn. “

Zoology—

Actinida—Danielsson. “

Alcyonida—Danielsson. “

Annelida—Hansen. “

Asteroidæ—Danielsson and Koren. “

Buccinidæ—Friele. “

Crinoidea—Danielsson. “

Crustacea I—Sars. “

Crustacea II—Sars. “

Fishes—Collett. “

Gephyrea—Danielsson and Koren. “

Holothuroidea—Danielsson and Koren. “

Mollusca II—Friele. “

Pennatulida—Danielsson and Koren. “

Pycnogonidea—Sars. “

Spongiadæ—Hansen. “

—University of Christiania.

Die Pflanzenwelt Norwegens.

1d

“Beretning om Ladegaardsoens Hovedgaard,”
1862 and 1863.

1d

—Den Hoiere Landbrugskole i Oas.

Norges Officielle Statistik, 1871-73, 1876.

29e

—Norwegisches Meteorologisches Institut.

Jahrbuch, 1885-89, 90. +

20e

—Oversigt over Videnskabs-Selskabets Moder. 1888,
89, 90. +

2d

—Videnskabs-Selskabet i Christiania.

Forhandlinger, 1884, 85, 86, 87. +

1b

<i>Journals.</i>	15
CHUR [Switzerland] Naturforschende Gesellschaft Graubundens. Jahresberichte, Nos. 33, 34, 35 (1888-91). +	19c
CINCINNATI [Ohio] Journal of Comparative Neurology. Vols. I, pts. 1-4; IV, pts. 1-2. +	22a
—Cincinnati Society of Natural History. Journal, Vols. I, No. 4; II, 1-4; IV, 2; VI, 2; VII, 3-4; XII, 4; XIII, 1-4; XIV, 1-4; XV, 1-2. +	4a
CLEVELAND [Ohio] Cleveland Academy of Natural Science. Proceedings, 1845-1859. +	4a
COIMBRA [Portugal] Sociedade Broteriana. Boletim, Vol. X. +	22d
COLORADO SPRINGS [Colorado] Colorado College Scientific Society. Colorado College Studies, Annual Publications 1-3. +	2a
COLUMBUS [Ohio] Agricultural Experiment Station. Bulletin, Vol. I, No. 1; II, 2-8; III, 1-2; IV, V, 1-4. +	28e
Second series, Nos. 3, 4, 42-44. +	28e
—Geological Survey of Ohio. First Annual Report, 1838. Geology, Vols. I and II. Paleontology, Vols. I and II. Maps, 1873. Report 1890 (with Maps).	15a 15a 15a 15a 15a
COPENHAGEN [Denmark] Kongelige Danske Videnska- bernes Selskabs. Fortegnelse over de af det K. D. V. K. S. i Tidsummet, 1742-1891. +	19d
Oversigt, 1874, 75, 76, Nos. 1 and 2; 77-83, 1; 84, 2-3; 85, 86, 1-3; 87-90, 1-3; 91, 1. +	2c

- CORDOBA [Argentine Republic] Academia Nacional de Ciencias.
Boletin, Vol. VI, pts. 2-4. + 9d
- DANTZIG [Germany] Naturforschende Gesellschaft.
Schriften, Vols. II, Nos. 3-4; III, 2-4; IV, V,
VI, VII. + 10d
- DAVENPORT [Iowa] Davenport Academy of Natural Science.
Proceedings, Vol. II. 23c
- DENVER [Colorado] The Colorado Scientific Society.
Proceedings, Vols. I-III, pts. 1-2. 4a
- DES MOINES [Iowa] The Analyst.
Vols. I-VIII, IX, pts. 1, 3, 6; X, pts. 2-5. 21b
- Iowa Academy of Sciences.
Proceedings, 1875-80; 1887-89. 4a
Papers in Abstract, 1887-89. 4a
Proceedings (New Series), Vol. I, pt. 2, 1890-91. + 4a
- Des Moines Academy of Sciences.
Bulletin, Vol. I, No. 1, 1885. 4a
- DIJON [France] Academie des Sciences, Arts et Belles
Lettres.
Memoires, Series 3, Vols. IV-X. 2b
Series 4, Vol. II. + 2b
- DONAI [France] Union geographique du Nord de la France.
Bulletin, Vol. XIII, Trimestre 1, 1892. + 13a
- DRESDEN [Germany] Fuhrer durch die Koniglichen Samm-
lungen zu Dresden (Mit Nachtrag.) 19d
- Berichte uber die Verwaltung, u. Vermehrung des
Koniglichen Sammlungen fur Kunst u. Wissen-
schaft. 1879-1887. 19d
- Naturwissenschaftliche Gesellschaft Isis.
Sitzungsberichte, 1874, pt. 2; 75, 76, pt. 2; 77,
pt. 1; 78, pt. 1; 79, pt. 2; 80, 81, 82, 83, pt.
1; 84-90, pt. 1. + 6a

DUBLIN [Ireland] Works by Dr. James Henry.

Aeneidea, Vols. I-IV.	27a
From Dresden to Venice.	27a
From Carlsruh to Bassono.	27a
Poematia.	27a

—Royal Dublin Society.

The Journal, Nos. 1-2, 4-5, 12-13, 16-17, 26-29, 30-31, 34-37, 39, 44. +	3c
Scientific Proceedings, N. S., Vols. I-VII, pts. 1-4. +	3d
Scientific Transactions, Vols. CLXV, pt. 2; CLXVI, pt. 1.	3e
N. S., Vols. I-IV, Nos. 1-3. +	3e

—Royal Irish Academy.

"Cunningham Memoirs," Nos. 2-7.	3e
Irish Manuscript Series, Vols. I, pt. 1; II, pt. 1. +	3e
List of Papers published in various publications.	
Transactions. Science—Vols. XXIV, pt. 9; XXV, XXVI, 1-16, 22; XXVII, 1-8; XXVIII, 1-13, 17-25; XXIX, 1, 3, 14-19; XXX, 1, 2.	3e
Polite Literature and Art—	
Series 2, Vols. I, No. 13; II, 1-4, 6-8. +	3d
"Todd Lecture Series," Vol. II, pts. 1-3. +	3d
Proceedings. Science—	
Series 2, Vols. III-IV, Nos. 3-6.	3d
Series 3, Vols. I, Nos. 1-5; II, 1-3. +	3d

EDINBURGH [Scotland] Edinburgh Geological Society.

Transactions, Vol. VI, pt. 3. +	14a
---------------------------------	-----

—Royal Society of Edinburgh.

Proceedings, Vols. VIII-XVIII (1872-1891). +	3a
--	----

EKATHERINEBOURG [Russia] Societe Ouralienne d'Amateurs
des Sciences Naturelles.

Bulletin, Vols. IV-VII, VIII, liv. 1; IX, liv. 1; X, XI, liv. 1-2; XII, liv. 1-2. +	19e
--	-----

- ELBERFELD** [Germany] Naturwissenschaftlicher Verein in Elberfeld.
 Jahresbericht, Hft. 7. + 5d
- EMDEN** [Germany] Naturforschende Gesellschaft in Emden.
 Jahresberichte, 56-65, 67, 69, 71-76. + 8e
 Kleine Schriften, 5-7, 9, 11-13, 15-18. + 8e
 Papers—
 M. A. F. Prestel. Ein Beitrag zur Physiologie der Atmosphäre. 8e
 M. A. F. Prestel: Die Winde über der deutschen Nordseeküste u. d. Sudl. Theile der Nordsee. + 8e
 Festschrift, December 29th, 1864. 8e
- ERLANGEN** [Germany] Physikalisch-medicinische Societat in Erlangen.
 Sitzungsberichte, Hft. 24 (1892). + 19c
- EVANSTON** [Illinois] Northwestern University.
 Report of the Department of Natural History, 1887 and 1892. + 4b
- FLORENCE** [Italy] Biblioteca Nazionale Centrale.
 Bolletino delle Pubblicazioni Italiane.
 1886, pp. 1*-155,* 1-132, 153-224, 241-340. (I-XXXII, XXXVII-LII, LVII-LXXII, XCVII-CXX.) 23b
 1887, pp. 1*-64,* 81*-165,* 113-280, 317-332, 353-440. (XXV-XXIX, LXIX-CXVI) 23b
 1888, pp. 1*-158,* 1-52, 69-448. (I-XII, XVII-CXVI.) 23b
 1889, pp. 1*-16,* 65*-112,* 129*-158,* 1-392, 413-448. (I-LXXXIV, LXXXIX-CXX.) 23b
 1890, pp. 1*-48,* 65*-112,* 129*-152,* 1-368, 389-404, 421-436. (I-LXXX, LXXXV-LXXXVIII, XCIII-CXVI.) 23b
 1891, pp. 1-68, 85-156, 177-292, 313-444. (I-XVI, XXI-XXXVI, XLI-LXIV, LXIX-XCVI.) 23b
 1892, pp. 1-116, 229-244, 253-404. (I-XXXVI, LIII-LVI, LXXXI-XCII. + 23b

- R. Instituto Studi Superiori Practice e di Perfezionamento.
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- “Il Commento di Sabbatai Domrolo sul Libro della Creazione.” 1d
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- “Della Interpretazione Panteistica di Platone.” 1d
- Archivio della Scoula D'Anatomia Patologica, Vols. I and II. 1d
- “I Pin Antichi Frammenti del Costituto Fiorentino.” 1d
- “La Ribellione di Masacado e di Sumitonio.” + 1d
- FRANKFURT A. M. [Germany] Physikalischer Verein.
Jahresberichte, 1877, 78, 79-91. + 12c
- FRANKFURT A. O. [Germany] Naturwissenschaftl. Verein des Reg. Bez. Frankfurt.
Monatliche Mitth. a. d. Gesamtgeb. d. Naturwissenschaften, Jahrgange VII and VIII. + 12b
- Societatum Litteræ.
(Herausgegeben v. Dr. Ernst Huth), Jahrgang, (1890) 1-3. + 23e
ii-3 Ap.

- FRAUENFELD [Switzerland] Thurgauische Naturforschende Gesellschaft.
Mittheilungen, Hft. 8 and 9. + 5c
- FREIBOURG [Switzerland] Societe Fribourgeoise des Sciences Naturelles.
Bulletin, 1883-1887, 1887-1890. + 9d
- FREIBURG [Germany] Naturforschende Gesellschaft.
Berichte uber die Verhandlungen, Vols. VI, pts. 1 and 4; VIII, pts. 1, 2 and 3. + 8a
- GENEVA [Switzerland] Societe de Geographie de Geneve.
Le Globe (Bulletin de la Societe,) Vol. XXXI, No. 1, (1892.) + 13a
- Societe de Physique et d'Histoire Naturelle.
Compte Rendu des Seances, Vol. IX. 19d
- GERA [Germany] Gesellschaft v. Freunden d. Naturwissenschaften in Gera.
Verhandlungen, Vols. II, and III. + 8a
- GIESSEN [Germany] Oberhessische Gesellschaft.
Jahresberichte, 7-9, 11-13, 16-35. + 8a
Berichte, XV, XVII-XXVI. + 6e
- GLASGOW [Scotland] Geological Society of Glasgow.
Transactions, Vols. VII, VIII and IX. 14b
- Natural History Society of Glasgow.
Proceedings and Transactions, (New Series) Vol. III, pt. ii, (1889-90.) + 19d
- GORLITZ [Austria] Naturforschende Gesellschaft.
Abhandlungen, Vols. XV-XIX. + 8b
- GOTTINGEN [Germany] Kgl. Gesell. der Wissenschaften und der Georg-Augusts-Universitat.
Nachrichten, 1877-82, 1884-93, Nos. 210. + 6a
- GRANVILLE [Ohio] Journal of Comparative Neurology, Edited by C. L. Herrick, Granville, Ohio. Vols. I, II, pts. i-iii. + 19a
- Denison University.
Bulletin of Scientific Laboratories, Vols. VI, pt. i; VII. + 4b

- 'sGRAVENHAGE (AND BATAVIA) [Holland] Koninklijke Natuurkundige Vereeniging in Nederlandsch-Indie.
Natuurkundige Tijdschrift voor Nederlandsch-Indie, Vols. XXXV-XXXIX, XLI, XLIV-XLVIII, L. + 11b
- 'sGRAVENHAGE [Holland] Nederlandsche Maatschappig ter bevordering van Nijverheid.
Algemeene Vergadering, 1873-75. + 26c
Willem III. + 26c
Tijdschrift, 1873-77, 78-82, 84-90. + 26d
Handelingen en Mededeelingen, 1874-76. + 26d
- GRAZ [Austria] Naturwissenschaftlicher Verein für Steiermark.
Jahrgang, 1890-91. + 5d
- GREIFSWALD [Germany] Geographische Gesellschaft zu Griefswald.
Jahresberichte II, 1, 2; III, 1, 2; IV. + 13a
- HAARLEM [Holland] Archives du Musée Teyler.
Vols. I-III, IV, pt. i; V, pt. ii. 10d
Second Series, Vols. I, pts. i-iii; II, pts. ii-iii; III, pts. i-vii. + 10d
—Wekelijksche Courant de Nijverheid, Nos. 1-13. 29a
—Koloniaal Museum.
Bulletin, January, 1893. + 19d
—Fondation Teyler.
Catalogue de la Bibliothèque, Vols. I, pts. i, ii, v-viii; II, pts. i-iii. 23a
—Société Hollandaise des Sciences à Haarlem.
Archives Néerlandaises des Sciences Exactes et Naturelles, Vols. XII, XIV, pts. i-ii; XV, i-ii; XVI, XVII, ii; XIX, iv-v; XX, i-v; XXI, i, iv, v; XXII-XXV, XXVI, i, ii, iii; XXVII, i-ii. + 11d
—Nederland. Maatsch. ter Bevordering van Nijverheid.
Tijdschrift, 1874-1890. 26d

- HALIFAX [Nova Scotia] Nova Scotian Institute of Natural Science.
 Proceedings and Transactions, Vols. II, iv; IV, 4, V i, ii, iv; VI, VII (end of old series.) 2d
 New Series, Vol. I, + 2d
- HALLE [Germany] Kgl. Leop.-Carol.-Deutsche Academie der Naturforscher.
 Leopoldina, Hft. 18. 8e
 Nova Acta, Vols. XL, No. 9; XLI, No. 6. 8e
- Naturwissenschaftlicher Verein f. Sachsen und Thuringen.
 Zeitschrift f. Naturwissenschaften, Vols. LV, LVI, i-ii; LVII, iii-v; LVIII, LIX, i, ii, v, vi; LX-LXIII, LXIV, i-v; LXV, i-iii, vi. 11d
- HAMBURG [Germany] Naturwissenschaftlicher Verein in Hamburg.
 Abhandl. a. d. Gebiete d. Naturwissenschaften, Vol. XII, Hft. 1. 19e
- Verein für Naturwissenschaftlicher Unterhaltung zu Hamburg.
 Verhandlungen, Vol. VII, 1886-90. + 19d
- HAMILTON [Canada] The Hamilton Association.
 Journal and Proceedings, Sessions 1890-91, 91-92. (Nos. VII and VIII.) + 2a
- HARRISBURG [Pennsylvania] Geological Survey of Pennsylvania.
 (See under Geology.) 17d
- HEIDELBERG [Germany] Naturhistorisch-Medizinischer Verein.
 "Festschrift zur Feier des funfhundertjährigen Bestehens der Ruperto-Carola." 6e
 Verhandlungen, Vols. I, (pp. 229-444 wanting) II, pp. 171-312; III, pts. i-v; IV, pts. i-v. + 6e
- HELSINGFORS [Finland] Finlands Öfficiela Statistik.
 Aren. 1846, 1865. 20c
- Observatoire Magnetique et Meteorologique.
 Report, 1873. 20c

- Societe des Sciences de Finland.
 Observations Meteorologiques, Annees 1873 and
 1878. 20c
- Finska Vetenskaps-Societeten, 1838–1888.
 Ders Organisation och Verksamhet. 2a
 Bidrag till Kannedom af Finlands Natur och Folk.
 Hfts. 16; 18–19, 22–25, 32, 37–42, 43, 45–47.
 50, 51. + 2a
 Ofversigt, 1870–74, 81–82, 85–87. + 2a
- Acta Societatis Scientiarum. Fennicæ, Vols. IX–XII,
 XIV, XV, XVII. 10e
- Commission Geologique de la Finlande.
 Carte Geologique de la Finlande, Liv. 22–24. + 13e
- HERMANNSTADT [Austria] Verein fur Naturwissenschaften
 in Hermannstadt.
 Verhandlungen und Mittheilungen, Jahrgang XLI. + 5d
- INDIANAPOLIS [Indiana] Geological Survey of Indiana.
 Maps, 1869. 16a
 Reports—
 Maps of First Report. 15b
 Second Report. 15b
 Third and Fourth Reports, with Maps. 15b
 Fifth Report, with Maps. 15b
 Second Report, 1870, Vol. II. 16a
 Annual Report, 1888. 16a
- Indiana Geological Department.
 Natural Gas Maps of Indiana. 16a
- INNSBRUCK [Austria] Naturwissenschaftl. Medicinisch. Ver-
 ein in Innsbruck.
 Berichte, Jahrgang XX (1891–92). + 19a
- IOWA CITY [Iowa] Bulletin from the Laboratories of Nat-
 ural History of the State University of Iowa.
 Vol. II, No. 3, 1893. + 22d
- ITHACA [New York] Cornell University.
 Ten Year Book, Vol. II. + 26a
 Exercises at Opening of the Library Building,
 1891. 26a

- ITHACA [New York] Cornell University—continued.
- Studies in Agriculture. (Reprinted from Agricultural Experiment Station Reports now out of print). 26a
- Bulletin of Cornell University. (Science.). Vol. I. + 26a
- Library Bulletin, Nos. 1-31. + 23a
- Exercises and Addresses at the Laying of the Corner Stone of the University Library Building, 1889. 26a
- JEFFERSON CITY [Missouri] Geological Survey of Missouri.
- Bulletin, 1887, Nos. 2-4; 1889, 1, 5; 1890-91, 2-5. + 16a
- Biennial Report, 1891. + 16a
- Report on Coal. (1891.) 16a
- Report on Iron Ores. (1892.) 16a
- The Higginsville Sheet. + Atlas Case
- JENA [Germany] Medicinisch-Naturwissenschaftliche Gesellschaft.
- Zeitschrift, Neue Folge, Vols. III-X. + 6e
- Denkschriften, Vol. II, pts. 1-2. + 9d
- KANSAS CITY [Missouri] Kansas City Review of Science and Industry.
- Vols. I-V, VI, 1-10; VII, 1-4, 6, 8; IX, 3-5. 4b
- KASSEL [Germany] Verein für Naturkunde zu Cassel.
- Berichte, XXIX-XXXVIII. + 5d
- Festschrift, 1886. 5d
- Catalog der Bibliothek, 1875. 5d
- KEW [England] Hooker's Icones Plantarum.
- Vols. XI-XXI, pts. 1-3; XXII. (Series 3, Vols. I-X. Series 4, Vols. I, pts. 1-3; II.) + 22d
- KHARKOW [Russia] Societe des Naturalistes a l'Universite Imperiale de Kharkow.
- Travaux, Vols. XIII-XV. + 11d
- KIEL [Germany] Mineralogisches Institut der Universitat Kiel.
- Mittheilungen, Vol. I. (1888-1892.) + 14b

Journals.

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- Universitat zu Kiel.
Schriften, 1856, 1881-2, 84, pt. 1; 85, 1; 87, 1;
88, 1-3; 89, 1; 90, 1. + 5e
- KOLOZSVART [Russia] Ertesito az Erdelyi Muzeum-Egylet
Orvos-Termesztudomanyi.
Szakosztalyabol, Vol. XVII. + 19
- KONIGSBERG [Germany] Preussischer Botanische Verein in
Konigsberg.
Jahresbericht, 1891-2. + 22c
- Physikalisch-Okonomische Gesellschaft zu Konigsberg.
Schriften, Jahrgange 14 (IIte Abth.), XV-XXXI,
1873-1890. + 6e
- LAUSANNE [Switzerland] Societe Vaudoise des Sciences Nat-
urelles.
Bulletin, Vols. XIV, except Nos. 75-76, XV,
XVI, except No. 82; XVII, XVIII, XX-
XXVII. + 9b
- LAWRENCE [Kansas] University of Kansas.
Kansas University Quarterly (begun 1892),
Vol. 1, Nos. 1-3. + 19d
- LEEDS [England] Leeds Geological Association.
Transactions, 1886-1891. + 15b
- Philosophical and Literary Society.
Annual Report, 1890-91, 91-92. + 2a
- LEIPA [Bohemia, Austria] Nordbohmisches Excursions-
Club.
Mittheilungen, Jahrgange XII-XV (1889-92). 19e
- LEIPZIG [Germany] Verein fur Erdkunde.
Mittheilungen, 1878, 1880-83, 1886. + 10b
- Naturforschende Gesellschaft zu Leipzig.
Sitzungsberichte, 1891-92. + 8c
- LIEGE [Belgium] Societe Royale des Sciences.
Memoirs, Vols. VI-IX, XI-XII, XIV-XVII. 9a
- Melanges Geologiques par G. Dewalque. Series 5
and 6. + 13d

- Societe Geologique de Belgique.
 Annales, Vols. I-III, VIII, X-XIII, XIV, pt. 2;
 XV, 2, 3; XVI, 1. + **15a**
- LILLE [France] Societe Geologique du Nord.
 Memoires, Vols. I-III. + **13d**
- LINCOLN [Nebraska] University of Nebraska.
 University Studies, Vol. I. Nos. 1-4. + **2b**
- LISBON [Portugal] Academia Real das Ciencias de Lisboa.
 Conferencias. Numbers 1-3 (1877), 4 (1880). + **10c**
 Sersao Publica, 1875, 1877 and 1880. **19c**
- Commissao dos Trabalhos Geologicos de Portugal.
 Comunicacoes, Vols. I, III, fasc. 2. + **14b**
- Historia dos Estabelecimentos Scientificos, Litterarios
 e Artisticos, Vols. I-IX. **27d**
- LITTLE ROCK [Arkansas] Arkansas Geological Survey.
 Annual Reports, 1888, Vols. I-IV; 1889, II;
 1890, I, III; 1891, I; 1892, I. + **16c**
- LIVERPOOL [England] Geological Association.
 Transactions (Journal), Vols. II, IV-VI, IX-XII. + **14a**
- LONDON [England] Royal Society.
 Proceedings, Vols. XXIX-LI. + **3b-c**
- Geological Society of London.
 Abstracts of Proceedings, Nos. 476-594, (Sessions
 1885-1892.) + **14d**
- Annals of British Geology, by J. F. Blake, 1890. + **14a**
- Royal Horticultural Society.
 Journal, Vol. IV, Nos. 14-16. (1874). **22b**
- British Museum (Natural History).
 Zoological Collections. **19c**
 Guides to Galleries of Museum. **19c**
 British Oligocene and Eocene Mollusca. **19c**
- Society of Arts.
 Journal, Nos. 2087-2096, 2098-2103. **20b**
- LOUVAIN [Belgium] Universite Catholique de Louvain.
 Annuaire, 1883-92. **27a**
 Liber Memoriales, 1834-1884. **27e**

- LUND [Sweden] Acta Universitatis Lundensis.
Lunds Universitets Ars-skrift, Vol. XXVI, pts.
1 and 2 (1890). 26b
- LUNEBURG [Germany] Naturwissenschaftlicher Verein.
Jahresheft, II. + 10b
- LYON [France] Academie des Sciences, Belles-Lettres et
Arts de Lyon.
Memoires. 30b
Classe des Sciences, Vols. XV-XXV,
XXVII-XXXI. 30a-b
Classe des Lettres, Vols. XVIII, XIX,
XXI-XXVIII. 30a
3d Series, Sciences et Lettres, Vol. I
(1893). + 30b
- Societe Botanique de Lyon.
Bulletin Trimestriel. Annee X, No. 4 (1892). + 22
- LE MANS [France] Societe d'Agriculture, Sciences et
Arts de la Sarthe.
Bulletin, 2d Series, Vols. XIII, XIV, XV, Nos.
1-3; XVI-XIX and Suppl.; XX, 2, 4; XXI,
1, 2; XXII, 1-3; XXIII, XXIV, 3, 4; XXV,
1-4; XXXI, 3-4; XXXII, 4; XXXIII, 2-4;
XXXIV, 1. 1a
- MADISON [Wisconsin] Washburn Observatory.
Publications, Vols. V, VI, pts. 1-2; VII, 1. + 20b
- Wisconsin State Historical Society.
Catalogue, Vols. I, II, pts. 1-2; Suppl. No. 1. + 23b
- University of Wisconsin.
Agricultural Experiment Station.
Bulletin, Nos. 3, 6-22. + 28c
Annual Report, 1, 3, 4, 6. 28c
- Wisconsin Geological Survey,
Annual Report, 1876-1877. 16a
Geology of Wisconsin, Vols. I-IV (two sets). 16a
Atlases to Accompany Vols. I-IV of Geology of
Wisconsin. Atlas Case

- Wisconsin Academy of Sciences, Arts and Letters.
 Transactions, Vols. I-VIII (two sets). 3c
 Bulletin Nos. 2-5 (two sets). 3c
- MADRID [Spain] Real Academia de la Historia.
 Boletín, Vols. I, pts. 1-5; II, 4; V-XII, XV-
 XXI. + 27c
- MAGDEBURG [Germany] Naturwissenschaftlicher Verein in
 Magdeburg.
 Jahresber. u. Abhandlungen, 1885-91. + 19d
- MANCHESTER [England] Manchester Geographical Society.
 Journal, Vols. I, II and Suppl.; III, IV, 7-12;
 V, 1-6, 11-12; VI. + 13a
- Manchester Geological Society.
 Transactions, Vols. XXI, Nos. 1-18; XXII, 1-2. + 14b
- Manchester Literary and Philosophical Society.
 Proceedings, Vols. XIII-XIX, XXI-XXVI. 2b
 Catalogue of Books in Library. 2b
 Memoirs, 3d Series, Vols. V, VI, VIII, X. 2b
 Proceedings and Memoirs, 4th Series, Vols.
 I-IV, V, pt. 1. + 2b
- MARBURG [Germany] Gesellsch. zur Beforderung der Ge-
 samnten Naturwissenschaften.
 Jahrgänge, 1891-92. + 19a
- MELBOURNE [Victoria] Geological Society of Australasia.
 Transactions, Vol. I, pt. 6. + 14d
- METZ [Germany] Academie de Metz.
 Memoires, 3d Series, Vols. I-V, VII, pt. 1. + 9b
 Tables Generales des deux Premieres Series, 1819-
 1871, + 9b
- MEXICO [Mexico] Observatorio Astronomico Nacional.
 Anuario, 1885, 89, 91, 93. + 20c
 Bulletin, Vol. I, Nos. 1-10. + 20c
- Sociedad de Geografia y Estadística.
 Boletín, Vols. IV, V. 13a
- Sociedad Mexicana de Historia Natural.
 Periodico Científico, Vols. I, II, Nos. 1 and 2. 9e

- La Naturaleza.
 Periodico Cientifico de la Sociedad Mexicana de
 Historia Natural, 2d Series, Vol. I, 1887-90. + 19e
- Museo Nacional de Mexico.
 Anales, Vols. I, pts. 1, 2, 6, 7; II, III, 1-4, 7-9,
 11; IV, 2, 3. + 9e
- Sociedad Cientifica "Antonio Alzate."
 Memorias y Revista, Vols. I, pts. 1-5, 8-10, 12;
 II, 12; III, 1, 2, 7-12; IV, 3, 4, 7-10;
 V, 1-2. 8a
- MILAN [Italy] Reale Instituto Lombardo di Scienze e
 Lettere.
 Atti della Fondazione Scientifica Cagnola, Vols.
 V, VI, pt. 1; VII, IX, X. 2d
 .Rendiconti.
 2d Series, Vols. III, VI, fas. 6-20; VII,
 VIII, XI, XV-XVII, XIX, XXII,
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 3d Series, Vols. I, fas. 1-13; II, 17-20. — 31c-d
 Memorie, Vols. XI, fas. 2-3; XII, 1, 2, 6; XIII,
 1, 2; XIV, 2, 3; XVI, 2, 3; XVII, 1. + 31d
- Societa d'Esplorazione Commerciale in Africa.
 Anno VII, fas. 5, 7-10. + 13a
- Istituto Botanico dell' Universita di Pavia.
 Atti, 2d Series, Vol. II. + 22d
- MILWAUKEE [Wisconsin] Naturhistorischer Verein von Wis-
 consin.
 Jahresberichte, 1876, 1878-79, 1879-80, 1880-81,
 1881-82. 4b
- MINNEAPOLIS [Minnesota] Minnesota Academy of Natural
 Sciences.
 Bulletin, Vol. II, Nos. 2-5; III, 1, 2. + 4a
- Quarterly Bulletin of the University of Minnesota.
 Vol. I, Nos. 1-3, 1892-93. + 26a
- Geological and Natural History Survey of Minnesota.
 "Geological and Natural History of Minnesota,"
 Vols. I, II, 1872-1885. + 16c

- Minnesota Geological Survey.
 Bulletin, Nos. 1-7. + 16e
 Annual Report, Vols. I-XX + 16e
- MODENA [Italy] Regia Accademia di Scienze, Lettere ed
 Arti.
 Memorie, 1st Series, Vols. XVI-XX, 1875-1883;
 2d Series, Vols. I-VII, 1883-1890. + 1e
- Societa dei Naturalisti.
 Annuario, 2d Series, Vol. XII, pts. 1-3. + 9d
- MONS [France] Societe des Sciences, des Arts et des Let-
 tres de Hainaut.
 Memoires et Publications.
 3d Series, Vols. IV, VII, VIII, X. 1e
 4th Series, Vols. I-III, V, VI, VIII-X. 1e
 5th Series, Vols. I-III. + 1e
- MONTGOMERY [Alabama] Geological Survey of Alabama.
 Bulletin, Nos. 2-3. 15c
- MONTPELLIER [France] Academie des Sciences et Lettres
 de Montpellier.
 Memoires de la Section de Medicine, Vol. IV, pt.
 3; V, 2-3. + 9e
 Memoires de la Section des Sciences, Vol. VI,
 pts. 2-3; VII, VIII, IX, 1-3; X, 2-3. + 9e
- MONTREAL [Canada] Royal Society of Canada.
 Proceedings and Transactions, Vol. IX. 19e
- Natural History Society of Montreal.
 The Canadian Record of Science, Vols. I-IV,
 V, Nos. 1-5. + 19b
- MOSCOW [Russia] Landwirtschaftliche Akademie.
 Meteorologische Beobachtungen, 1888, 1889, pt. 1;
 1890. + 21c
- Societe Imperiale des Naturalistes.
 Bulletin, 1885, 1886, Nos. 2-4; 1887-91, 1892,
 1-2. + 19c
 Nouveaux Memoires, Vol. XV, No. 6. + 19c

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MT. HAMILTON [California] Lick Observatory.	
Report of Trustees.	20e
Publications, Vol. I (1887.)	20e
Report—Eclipses—Total of Sun January and December, 1889, of Moon July, 1888. +	20e
MUNICH [Germany] Royal Observatory.	
Annals, Vol. XX +	20c
—— Bayerische botanische Gesellschaft zur Erforschung der heimischen Flora.	
Berichte, Vols. I-II. (1891-92.) +	22b
—— Konigl. bayer. Akademie der Wissenschaften.	
Sitzungsberichte. (Math. physikal. Classe.) 1869	
Vol. II, pt 4; 1870; 73; 75-82: 84-90; 91 pts	
1-2. +	8d
Inhaltsverzeichniss d. Sitzungsber. d. Math.-physikal. Classe, Jahrgänge 1871-1885.	8d
Sitzungsber. (Philosoph.-philolog. und hist. Classe.) 1887, Vol. II, Nos. 2 and 3; 1888, No. 1.	8d
Verschiedene Publicationen, 1882-84, '86, '87, '89, '90. +	8d
NAPLES [Italy] Societa Italiana delle Scienze. Memorie di Matematica e di Fisica.	
Vols. III-VII. +	9e
—— Societa di Naturalisti in Napoli.	
Bollettino. Vol. V. +	9d
—— L'Anomalo (Edited by Dr. A. Zuccarelli.)	
Vols. II, Nos. 7-9, 10-12; III, 2, 3-5, 10-12; IV, 7 and 8.	6c
NEUCHATEL [Switzerland] Societe des Sciences Naturelles.	
Bulletin, Vols. X, pts 2-3; XI, XII, 1-2; XIV-XVI. +	10a
NEWCASTLE [England] North of England Mining and Mechanical Engineers.	
Transactions, Vols. XII-XVII, XXIII-XXX, XXXI, 1-3; XXXIV, 1-6; XXXV, 1-3; XXXVI, 2-4; XXXVII, 1-6; XXXVIII, 1-6; XXXIX, 1; XL, 1-4.	18a-b

- NEWCASTLE [England] North of England Mining and Mechanical Engineers—continued.
- Index to Vols. I-XXV, 1852-76. 18a
- Northumberland and Durham Borings and Sinkings, Part I, 1-2; II, 3-5; III, 6-11. 18b
- Council of Mining and Mechanical Engineers. Reports, 1890-91, parts I-III. 18b
- NEW HAVEN, [Conn.] Connecticut Academy of Arts and Sciences.
- Transactions, Vol. IX, part 1. + 19e
- NEW YORK [N. Y.] American Museum of Nat. Hist.
- Bulletin, Vol. I, Nos. 1-8; II, 1-4; III, 1-2. + 31a
- Annual Report of Trustees, Nos. 12-22. 31a
- Ann. Rep. President, 1892. 31a
- Torrey Botanical Club.
- Bulletin, Vols. IX, Nos. 1-8, 10-12; X-XIII, 1-8, 10-12; XIV-XVII, 1-7, 9-12; XVIII, XIX, 2, 3, 6-8, 9. + 22a
- N. Y. Microscopical Society.
- Journal. Vols. I-VIII, IX, 1885-92. + 22b
- Am. Ornithologists Club.
- The Auk. Vols. VI-IX, X, pt. 1, 1889-92. + 22a
- The Linnæan Society.
- Abstract of Proceedings, 1889-92. + 4c
- New York Academy of Sciences.
- Transactions, Vol. VII, No 7, 8. + 12b
- Annals. Vol. VII, Nos. 1-5. + 12b
- Columbia College.
- School of Mines Quarterly, Vol. XIV, No. 3. + 19a
- NUREMBERG [Germany] Naturhistorische Gesellschaft.
- Jahresbericht, Vol. VI-VII; VIII, pts. 3-13 and suppl. 7b
- ODESSA [Russia] Club Alpin de Crimee.
- Livraison II, 1892. + 13
- OTTAWA [Canada] The Ottawa Naturalist.
- Vols. III, No. 4; IV, 1-12; V, 1-11; VI, 1-5, 6, 8. + 4a

- PADUA [Italy] *Revista di Mineralogia e Cristallografia Italiana.* (Directed by R. Panebianco.)
 Vols. VII-X + 14b
- *Societa Veneto-Trentina di Scienze Naturali.*
Bulletino. Vol. V, No. 2. 19a
Atti, Vol. XII, No. 2. 2d Series, Vol. I,
 No. 1. + 19a
- PALERMO [Italy] *Reale Accademia di Scienze Lettere e Belle Arti.*
Bulletinc, Anno VIII, No. 3. (1891.) + 1d
- PARIS [France] *Prefecture de la Seine.*
Annuaire Statistique de la Ville de Paris.
Annees, Vol. VII-VIII. + 24a
Catalogue de la Bibliotheque Administrative
(Section etrangere) per A. Canot. 24a
- *Nouvelles Geographiques,* publiee sous la direction
 de F. Schrader.
Annee II, No. 1. 1892. + 13
- *Societe d'Ethnographie.*
Annuaire 1876, 1878, 1882. 25d
Actes 1877, No. 2, 1878. 25d
Bulletins, 1884, No. 2. 25d
- *Annuaire Geologique Universel,* Vols. I-VII. + 15d
- *Ministere de l'Instruction Publique.*
Catalogue, Vols. I-III. + 27a
- *Feuille des Jeunes Naturalistes, Revue Mensuelle*
d'Histoire Naturelle. (Adrien Dollfus, 35 rue
 Pierre Charron.)
Bulletin, *Annees* 7-10, 2d Series, Vols. I-II,
 3d Series, Vol. I. + 8a
Catalogue, fasc. 1-15. + 8a
- PHILADELPHIA [Penn.] *The Numismatic and Antiquarian Society.*
Constitution and By-laws. 25e
Report of Proceedings for years 1878, '79, '81-
 '83, '85. 25e
Notes upon Denarions of Augustus Caesar by H.
 Phillips. 25e

- Academy of Natural Sciences of Philadelphia.
 Proceedings, 1877-'92. + 5a-b
- The American Naturalist.
 Vol. XXVI, Nos. 1-7, 8, 12. + 19d
- The Franklin Institute.
 Journal, Vols. CXXXIII, Nos. 5, 6; CXXXIV,
 1-3, 6. + 20b
- Zoological Society.
 Annual Report, 1879-81, 83; 85-90. + 22b
- PORTLAND, [Maine] Portland Society of Natural History.
 Proceedings, Vol. I, pts 1, 2. +
 Journal, Vol. I, No. 1. +
 The Portland Catalogue of Maine Plants.
- POUGHKEEPSIE, [N. Y.] Vassar Brothers Institute and its
 Scientific Section.
 Transactions, Vols. II, IV, V. + 12a
- PRAGUE [Austria] System Silurien du Centre de la Boheme,
 par J. Barrande.
 Cephalopodes. Vol. II. 14a
 Brachiopodes, Vol. V. 14a
 Acephales, Vol. VI. 14a
 Defense des Colonies. 14a
- Konigl. bohmische Gesellschaft der Wissenschaften.
 Sitzungsberichte, 1879-91. + 10b
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 Verzeichniss der Mitglieder, 1784-1884.
 General Register zu den Schriften, 1784-1884. 10b
 Bericht über die Mathematischen und Naturwis-
 senschaftlichen Publikationen. Heft, 1-2. + 10b
 Geschichte sammt einer Kritischen Uebersicht
 ihrer Publikationen aus dem Bereiche der
 Philosophie, Geschichte u. Philologie. Heft,
 1-2. + 10b
- PRINCETON [N. J.] M. E. Museum of Geology and Arche-
 ology of Princeton College.
 Bulletin, Nos. 1-3. + 15b
- QUEBEC [Canada] Geographical Society of Quebec.
 Transactions, Vol. II, No. 1. 1892. + 13b

- REGENSBURG [Germany] Historischer Verein von Oberpfalz
und Regensburg.
Verhandlungen, Vols. XXXIV-XXXIX, XLI,
XLII, XLIII a-b, XLIV. + 26c
- Naturwissenschaftlicher Verein zu Regensburg.
Berichte, Hefts, II, III. + 5d
- RIGA [Russia] Rigasche Garten-bau Verein.
Jahresbericht, 14, 15. + 22a
- Naturforscher-Verein zu Riga.
Korrespondenzblatt, 30. (1892.) + 12c
- RIO DE JANEIRO [Brazil] Archivos. Museu Nacional.
Anthropologia Brasileira, Vol. VI. + 26e
- Brazilian Biographical Annual by Joaquin Manoel de
Macedo. Vols. I-III. + 27d
- Instituto Historico e Geographico Brasileiro.
Revista Trimensal. Vols. L, pts 1-2; LIV, 1, 2,
3, 4; LV, 1-2. 7d
- ROCHESTER [New York] Rochester Academy of Sciences.
Proceedings, Vols. I-II, (1891-92.) + 19c
- ROME [Italy] Codici Panciatichiani.
Indici e Cataloghi, Vols. I, Nos. 1, 2, 3, 6-10;
II, 1, 2, 3, 4. 23b
- Rassegna delle Scienze Geologiche in Italia.
(Edited by Cermenati and Tellini.)
Anno II, fas. 1-3. + 16a
- British and American Archeological Society of
Rome.
Vol. II, 12. + 25d
- R. Comitato Geologico d'Italia.
Bolletino. Vols. I-XXII. + 15c
- ROTTERDAM [Holland] Bataafsch. Genootschap der Proe-
fondervindelijke Wijsbegeerte.
Steven Hoogendijk de Stichter van het eerste
Stoomwerking in Nederland, 1787-1887. 26b
- Bataafsch Genootschap.
Nieuwe Verhandelingen. 1876, '82, '85, '90. + 20e
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- ROUEN [France] Societe normande de Geographie.
 Bulletin. Annee XIV, Jan. to Aug. + 13a
 — Societe des Amis des Sciences Naturelles.
 Bulletin. Annees XV, pt 1; XVII-XVIII, 1. + 10a
- ST. GALLEN [Switzerland] St. Gallische Naturwissen-
 schaftliche Gesellschaft.
 Bericht uber die Thatigkeit, 1874-75; 76-78;
 79-87; 88-91. + 7b
- ST. JOHN'S [Newfoundland] Geol. Survey of Newfoundland.
 Reports of Progress for year 1873. 15d
- ST. LOUIS [Missouri] Missouri Botanical Garden.
 Report, 1890-91, 92. + 22a
 — The Academy of Sciences of St. Louis.
 Charter, Constitution, By-laws, Exchanges, etc. 4c
 Transactions, Vols. III, pts. 1-2; IV, 1; V, 1,
 2-4; VI, 1-2. + 4c
- ST. PETERSBURG [Russia] Comite Geologique.
 Memoires. Vols. I, 1-4; II, 1-5; III, 1-4; IV,
 1-2; V, 1-5; VI, VII, 1-2; VIII, 1-2; IX,
 1; X, XI, 1-2; XIII, 1. + 15e
 Bulletin. Vols. I-III, IV, 1-10; V, 1-11; VI,
 (with supplements) VII-XI. + 14a
 — Kaiserliche Akademie der Wissenschaften.
 Repertorium fur Meteorologie, Vols. IV-XIV. + 21d
 Suppl. zum Repertorium fur Meteorologie, Vols.
 I-V. + 21d
 Atlas to Suppl. Ibid. Vols. I, II. + 21d
 — Kaiserliche Freie Okonomische Gesellschaft.
 Mittheilungen, 1855-63. + 26d
 — Russisch-Kaiserliche Mineralogische Gesellschaft.
 Verhandlungen, 2d Series, Vols. X-XXIX. + 13c
 Register. 13c
 Materialien zur Geologie Russlands, Vol. XVI,
 (1893.) + 13d
 — Physikalisches Central Observatorium.
 Annalen. Jahrgange, 1874-81, 1883-91. + 21e
 — Royal Botanical Gardens.
 Acta Horti Petropolitani. Vols. I-XII. + 22b

SACRAMENTO [California] University of California Agricultural Experiment Station.	
Bulletins, 80, 89, 90, 92-96.	28b
Report of Professor Hilgard for years 1879, 1884-1891. +	28b
— State Mining Bureau.	
Annual Report. 1884-86, pt. 2, '87-90. +	18b
SALEM , [Mass.] American Association for the Advancement of Science.	
Proceedings, Vols. I-XXIII, XXV-XLI. +	12cd
Memoirs, I. +	12cd
SAN DIEGO [California] The West American Scientist.	
Nos. 3-8, 18, 19, 23-35, 37-64.	4a
Index to Vols. I, II, III, IV.	4a
SAN FRANCISCO [California] Astronomical Society of the Pacific.	
Publications, Vol. V, 28 (1893.) +	20c
— California Academy of Sciences.	
Occasional Papers, Nos. 1-3. +	4b
Proceedings, Vols. V, VII, pt. 1; 2d Series, I-II, III, 1. +	4b
Bulletin, Vols. I-II. +	4b
SANTIAGO [Chili] Observatorio Astronomico.	
Reports, 1873-1881. +	20c
— Societe Scientifique.	
Actes, Vol. II, Nos. 1-2. +	19a
— Deutscher Wissenschaftliche Verein zu Santiago.	
Verhandlungen, Vols. I, heft 5; II, 1, 3. +	5d
— Oficina Central Meteorologica.	
Anuario, Vol. XVIII, pts 1-4. +	20e
SCHAFFHAUSEN [Switzerland] Schweizerische Entomologische Gesellschaft.	
Bulletin, Vols. VI-VIII, (1880-1888.) +	19a
SHANGHAI [China] China Branch of the Royal Asiatic Society.	
ournal, N, S., Vol. XXV, (1890-91.) +	19a

- SPRINGFIELD (Illinois) Geological Survey of Illinois.
 Vols. I, VII-VIII. + 15d
- Annual Report of the State Entomologist, 1871,
 1872, 1885. 28d
- STATE COLLEGE [Pennsylvania] Agricultural Experiment
 Station.
 Bulletins, 2, 4, 9, 10, 12. 28c
- STAVANGER [Norway] Stavanger Museum.
 Aarsberetning, 1890, 1891. + 12a
- STOCKHOLM [Sweden] Svenska Statens Historiska Museum.
 Feckningar, Haftet Forsta, 4th Series, plates
 1-10; Haftet Tredje, 5th Series, plates 1-5;
 Haftet Andra, 6th Series, plates 1-10. 27e
- Kongl. Vitterhets Historie och Antiquitets Akade-
 miens.
 Manadsblad, 1885-1890. + 27d
- Kongl. Svenska Vetenskaps Akademiens Forhand-
 lingar.
 Ofversigt, Vols. XXXIV-XLV. (1876-1888.) + 9c
 Handlingar, Vols. XI, XI Plates. XIII-XV.
 XV Plates, XVI-XXI. 10e
 Handlingar Vol. XV, No 6. (Florideernes Mor-
 phologi by J. G. Agardh. Atlas innehal-
 lende Tretiotre Taflor.) Atlas Case.
 Handlingar, Vol. XXI, No. 8. (Kritisk For-
 teckning ofver de i Riksmuseum Befintliga
 Salmonider by F. Smitt.) Atlas Case.
 Bihang till K. S. V. A. Handlingar. Vols. III-
 XIII. + 11c
 Acta Horti Bergiani, Vol. I. + 22a
 Lefnadsteckningar ofver efter ar 1854 afidna
 Ledamoter, Vol. II. 11c
 Forteckning ofver innehallet i Skrifter. 1826,
 1883. 11c
- Acta Universitatis Lundensis.
 Lunds Universitets Ars-Skrift, Vol. XXVI, pts
 1-2. 1890. + 26b

Journals.

39

- STRASBURG [Germany] Commission für die Geologische Landes-Untersuchung von Elsass-Lothringen.
Vols. I-III, IV, heft 1. + 13d
- SYDNEY [New South Wales] Royal Society.
Journal and Proceedings. Vol. XXVI (1892) + 19a
- Department of Mines.
Records of Geol. Survey of N. S. Wales. Vols.
I, II, pts 1-2; III, 1. + 15e
Annual Report, 1888, 1889, 1890. + 15e
Memoirs, 1875, 1887, 1888, 1890. + 15e
- TOKIO (Japan) Tokio Geographical Society.
Journal, 1891. + 13c
- Deutsche Gesellschaft für Natur- und Volkerkunde Ostasiens.
Mittheilungen, Heften 47-51. + 1d
(Earlier issues were from Yokohama.)
- TOPEKA [Kansas] Washburn Laboratory of Natural History.
Bulletin, Vol. I, Nos. 1-6; II, 9-11. 28c
- Kansas State Historical Society.
Kansas Historical Collections, Vol IV. + 27b
Annual Reports, 8th. + 27b
- The Kansas Academy of Sciences.
Transactions, Vols. III-VI, IX-XII. 4a
- State Agricultural College.
Experiments, 1883. 28c
Report of State Board, 1877. + 28c
- TORONTO [Canada] The Canadian Institute.
Proceedings, N. S., Vols. I, pts 2-5; III, 2-4;
V-VII. + 2a
Transactions, Vols. I, pts 1-2; II, 1-2. + 2a
Annual Reports, 1887-91. + 2a
An Appeal to The Canadian Institute on the
Rectification of Parliament. 2a

- TOULOUSE [France] Societe Francaise de Botanique.
 Revue de Botanique (Bulletin mensuel de la
 Societe.) Vols. III-VII, XI, Nos. 121-126,
 (1884-1888, 1893.) + 22e
- TRENTON [New Jersey] Geological Survey of New Jersey.
 Vols. I, II, pts 1, 2. (1888-90.) + 15a
- The Trenton Natural History Society, (Later issued
 under title of New Jersey Nat. Hist. Society.)
 Journal. Vols. I, Nos. 1, 3; II, 1, 2. + 4a
- TRIESTE [Austria] Osservatorio Marittimo di Trieste.
 Rapporto Annuale. Vol. VII, 1890. + 20e
- TRONDHJEM [Norway] Det Kongelige Norske Viden-
 skabers Selskabs.
 Skrifter. 1888-90. + 4d
- TUBINGEN [Germany] Verein f. Geschichte u. Naturge-
 schichte der Baar u. d. angrenz. Landesth. in
 Donaueschingen.
 Schriften, Heft VIII, (1893.) + 31d
- UPSALA [Sweden] Upsala Universitets Arskrift. 1889,
 90, 91. + 2d
- Observatoire de l'Universite d'Upsal.
 Bulletin. Vols. IV-IX. (1872-77.) + 20e
- Regiæ Societatis Scientiarum Upsaliensis.
 Nova Acta. Vols. IX, X, XI, pt 2; XII, XIII,
 2; XIV, 1. + 9d
- UTRECHT [Holland] Koninklijk Nederlandsch Meteorolog-
 isch Institut.
 Meteorologisch Jaarboek, 1870, 71, 75. + 20c
- Provinciaal Utrechtsch Genootschap van Kunsten
 en Wetenschappen.
 Aanteckeimegen van het verhandelde in de Sechi-
 Vergaderingen. 1871, 72, 74, 75, 76. + 1c
 Verslag van het Verhandelde in de Algemene
 Vergadering. 1872, 74, 75, 76. + 1c

Journals.

41

- VIENNA [Austria] Allgem. osterr. Chemiker u. Techniker
 Zeitung. Jahr. XI, Nos. 13-14. + 30b
 Inseratenbeilage, Nos. 13, 14. + 21c
- Zoologisch-Botanische Gesellschaft.
 Verhandlungen, Vols. XX, XXIII-XXXII. 6b
- Gartenbau-Gesellschaft in Wien.
 Wiener Illustrierte Garten-Zeitung. 1892, June-
 December. + 22c
- Kaiserliche Akademie der Wissenschaften.
 Math. Naturwissensch. Classe. Abth. I, Vols. LX,
 3-5; LXI, LXII, 1-2; LXVI-LXIX, LXX,
 2-5; LXXII, LXXIV, 3-5; LXXV, LXXIX,
 LXXX, LXXXVI, 1-2; LXXXVII, 1-3;
 LXXXVIII, LXXXIX, 1-3; XC, XCI, XCII,
 3-5; XCVIII, 8-10; C, 1-7. + 7c
 Abth. II, Vols. LX, 3-5; LXI, LXII, 1-3;
 LXVI, 1-4; LXVII, LXVIII, LXIX, LXX,
 1, 3, 4, 5; LXXI, LXXII, LXXIII, 1-3;
 LXXIV, 3-5; LXXV, LXXVI, 1; LXXIX,
 4, 5; LXXX, LXXXI, 1-3; LXXXVI, 2-5;
 LXXXVII, 5; LXXXVIII-XC, XCI, 1-3;
 XCIII, 1-2; XCV, 3; XCVI, 2-5. + 7e
-
- Abth. II a, Vols. XCII, XCVIII, 4-10; XCIX,
 C, 1-7. + 7e
 Abth. II b, Vols. XCVIII, 4-10; XCIX, C,
 1-7. + 7e
- Abth. III, Vols. LXVI-LXVIII, LXX-LXXII,
 LXXIV, LXXX, LXXXI, 1-3; LXXXV,
 1-2; LXXXVI, 3-5; LXXXVII, 1-3;
 LXXXVIII-XCII, XCV, XCVI, XCVIII,
 5-10; XCIX, C, 1-10. 7d
- K. Akademie der Wissenschaften.
 Registers. (For Vols. LI-LX, LXXXVI-XC.) + 7d
- K. K. Geologische Reichsanstalt.
 Verhandlungen, 1886-1892. + 13e
 Jahrbuch, Vols. XXXVI-XLII. + 13e

VIENNA [Austria]—continued.

- K. K. Landwirtschaft-Gesellschaft.
Verhandlungen, 3te Folge, Vols. V-VI. + 9c
- K. K. Naturhist. Hofmuseum.
Annalen, Vols. I-VI, VII, No. 1. + 12e
- K. K. Universitäts-Bibliothek.
Jahrbuch der Universität. 1891-92. + 30a
Uebersicht der Akademischen Behörden etc., a.
d. k. k. Universität zu Wien. 1892-93. 30a
Die Feierliche Inauguration des Rectors der
Wiener Universität. 1892-93. 30a
Öffentliche Vorlesungen a. d. k. k. Universität
zu Wien. 1892-93. 30a
- WASHINGTON, [D. C.] The National Geographic Magazine,
Vols. I-III. + 13a
- Bureau of Ethnology.
Annual Report, 1880-81, 82, 83, 85, 86. +. 25e
Introduction to Sign Language. 25e
Introduction to Mortuary Customs. 25e
- The American Monthly Microscopical Journal (Con-
taining Contributions to Biology.) Vols. IV,
5; VI, 9-11; VIII, 2; X-XII. + 23a
- War Department.
Report of the Secretary of War, 1876, Vols. I, II,
pts i-iii; 1877, I, II, pt i; 1878, I, II, pts
i-iii, III; 1879, I, II, pts i-iii, III; 1880, I,
II, pts i-iii; 1881, I, II, pts i-iii, III. + 29a-b
Report of Signal Officer. 1880, 81, 83, 86,
87, pt 1; 88, 89, 1, 2; 90. 21a
Professional papers of Signal Service. Nos. 2,
3-8, 10-13, 15, 16, 18. 20b
- U. S. Surveys. (See under Geology.) 16-18
- Smithsonian Institution.
Report, 1885, 1886, pt 2; 1887-1890. + 28e
Occasional Publications as follows:
The Use of Gold and Other Metals among
the Ancient Inhabitants of Chiriqui,
Isthmus of Darien, by W. H. Holmes. 26e

WASHINGTON [D. C.] Smithsonian Institution.

Occasional publications—continued:

Textile Fabrics of Ancient Peru, by W. H. Holmes.	26e
Perforated Stones from California, by H. W. Henshaw.	26e
Bibliographies of Algonquin, Eskimo, Iroquoian, Muskhogean and Siouan Languages, by J. C. Pilling.	26e
The Circular, Square and Octagonal Earthworks of Ohio. The Problem of the Ohio Works. Work of Mound Exploration of Bureau of Ethnology. By Cyrus Thomas.	26e
Catalogue of Pre-historic Works east of Rocky Mountains, by Cyrus Thomas.	26e
Omaha and Ponka Letters, by Jas. O. Dorsey.	26e
— Treasury Department.	
Mineral Resources West of Rocky Mts. Report of 1872-73.	18c
— U. S. National Museum.	
Proceedings, Vols. IV-XIII. +	5c
Bulletin. Nos. 1-15, 17-18, 20-32, 34, 37, 41-42. +	5c
— Philosophical Society of Washington.	
Bulletin, Vols. I-XI. +	19d
— National Academy of Sciences.	
Memoirs, Vols. I-IV. +	12e
— Department of the Interior. Census Bureau. +	
Ninth Census, Vols. I-III, (with Compendium.)	24c
Tenth Census. Vols. I-IV, VI-XXII.	24c-d-e
— U. S. Naval Observatory.	
Report of Superintendent for 1891. +	23e
Catalogue of Library, pt 1.	20e
Reports of Supt., 1884, 87, 90. +	20e

- WASHINGTON [D. C.] U. S. Naval Observatory—continued.
 U. S. Naval Observations. Appendix to Reports,
 1876, App. I, III. I. Index of Publications
 from 1845-75; 1884, App. I Catalogue of
 Stars, 1845-77, II. Reports of Solar Eclipses,
 July, 78,—Jan. 80; 1888, App. I Monograph
 of Nebulæ of Orion. 20e
 Annual Reports of Observations, 1853-60, 63,
 64, 66, 68, 72-87, 88. 20d-e
- Department of Agriculture. 28c
 Report of Commissioner, 1871, 1886, 1887. 28c
 Bulletins, 1, 9, 10, 13, 15-17, 41-43, 45-48. 28c
 Entomological Commission. 21b-d
 Annual Reports, 1875, 1877-1885. 28b-d
- WEIMAR [Germany] Thuringischer botanischer Verein.
 Mittheilungen, Neue Folge, Hefts III and IV,
 1893. + 22c
- WELLINGTON [New Zealand] Colonial Museum and Geolog-
 ical Survey.
 Report Col. Mus. and Lab., 27. + 13d
- New Zealand Institute.
 Transactions and Proceedings, Vol. XXV, 1893. + 19e
- WERNIGERODE [Germany] Naturwissenschaftlicher Verein
 des Harzes in Wernigerode.
 Schriften, Vol. VI. + 5d
- WIESBADEN [Germany] Nassauischer Verein für Natur-
 kunde.
 Jahrbuch, Vols. XXIX-XXX, XXXIII-XXXIV,
 XXXV, XXXVIII, XXXIX, XL, XLI,
 XLII, XLIII, XLIV, XLV. + 7b
- WORCESTER [Massachusetts] American Antiquarian So-
 ciety.
 Transactions, Vols. I, III, IV-VIII. + 25d
 Catalogue, Partial Index. 25d

WORCESTER [Massachusetts]—continued.

— Worcester Society of Antiquity.

- Proceedings, Foundation to 1877, 78-82, 84 to
90. + 25e
- Constitution and By-laws. 25e
- Papers. + 25e
- Inscriptions from the Old Burial Grounds in
Worcester, Mass., from 1727 to 1859. 25e
- The Abolitionists Vindicated in a Review of
Eli Thayer's paper on the New England
Emigrant Aid Company. 25e
- Address of Carlton A. Staples, January 27,
1885. 25e
- Early Records of the Town of Worcester,
Book II, 1740-1753. 25e

ZURICH [Switzerland] Naturforschende Gesellschaft.

- Vierteljahrsschrift, 1867-69, 72-84, 86, pts 3,
4; 87-88, 89, 1, 2; 91, 2-4; 92, 1. + 8c
- Generalregister der Publicationen. 8c

ZURICH-HOTTINGEN [Switzerland] International Entomo-
logical Society.

- Societas Entomologica, Vol. VIII, Nos. 3, 6.
(1893.) + 31d

NON-SERIALS.

(General.)

- ACQUOY, J. G. R. Het Klooster te Windesheim en Zijn
Invloed Nitgegeven door het Provinciaal
Utrechtsch Genootschap van Kunsten en Wet-
tenschappen. Deel 1, 2. 27b
- CASSINO, S. E. The Naturalist's Directory.
Parts 1, 2, Salem, 1878. 25d
- COGHLAN, T. A. A Statistical Account of the Seven
Colonies of Australia. Sidney, 1892. 24a

- FLOWER, W. H. A general guide to the British Museum of Nat. History.
(See British Museum of Nat. History.) 19c
- GEINITZ, H. B. Bericht uber die neue Aufstellung in dem Konigl. Mineralogischen Museum zu Dresden. Sitzungsberichte der Gesellschaft "Isis" in Dresden. Sitzung am 21 April, 1892, pp. 1-5.
- GOODE, G. B. The Museums of the Future. Washington, 1891. 23e
- HECTOR, J. Report on the Colonial Museum and Laboratory of New Zealand. New Zealand, 1891. 15b
- LAPA, JOAO IGNACIO FERREIRA. Technologia Rural on artes Chemicas, Agricolas e Florestaes. 2d
- MILLS, Simeon. Uncle John's Primer. Madison, 1892.
— Force. Madison, 1893.
- WINCHELL, A. Charts to accompany a Work entitled Michigan, being condensed popular sketches of the Topography, Climate and Geology of the State by Alex. Winchell. 15b

ALPHABETICAL SUBJECT-CATALOG.

AGRICULTURE.

SERIALS.

- AUGUSTA** [Maine] State Pomological Society.
 Annual Report of Secretary, 1874. 28d
- BOSTON** [Mass.] Agricultural Experiment Station.
 Bulletin, Nos. 38-40. 28c
 Analysis of Commercial Fertilizers, Nos. 743-766. 28c
- Board of Control of State Agricultural Experiment Station.
 Annual Report, 8. 28c
- CHAMPAIGN** [Illinois] Office of State Entomologist.
 Bulletin, No. 2, On the Chinch bug. 28c
- CHRISTIANIA** [Norway] Den Hoiere Landbrugsskole i Aas.
 Norges Officielle Statistik, 1871-73, 1876. 29e
- COLUMBUS** [Ohio] Agricultural Experiment Station.
 Bulletin, Vols. I, No. 1; II, 2-8; III, 2-11; IV, V, 1-4. 28c
 2d Series, Nos. 3, 4, 42-44. 28c
- s'GRAVENHAGE** [Holland] Nederlandsche Maatschappig ter
 Bevordering van Nijverheid.
 Tijdschrift, 1873-77, 1878-82, 1884-1890. 26d
- ITHACA** [New York] Agricultural Society of the State of
 N. Y.
 Principes de l'élevage des Animaux Domestique. 28d
- LANSING** [Michigan] Board of Agriculture.
 Report, 1890. Index of Reports, 1849-'88. 28d
- LONDON** [England] West of England Society for Agriculture.
 Journal for 1883. 28c

- MADISON [Wisconsin] University of Wisconsin Agricultural Experiment Station.
 Bulletin, Nos. 3, 6-11, 12-22. 28c
 Annual Report, 1, 3-4, 6. 28c
- Wisconsin Dairyman's Association.
 Seventh Annual Report. 28c
- PARIS [France] Ministère de l'Agriculture.
 Bulletin, No. 3, 1886. 28d
- Société Nationale d'Agriculture.
 Bulletin des Séances. Année, Vol. XVI, 1881. 28c
- SACRAMENTO [California] University of California.
 Department of Agriculture.
 Report of Professor Hilgard for years 1879,
 84-91. 28b
 Agricultural Experiment Station.
 Bulletins, 80, 89, 90, 92-96. 28b
- SPRINGFIELD [Ills.] Annual Report of the State Entomologist.
 1871, 72, 85. 28d
- Reports Returned to the Department of Agriculture.
 Illinois Crop Prospects for June, 1881. 28d
- TOPEKA [Kansas] State Agricultural College.
 Experiments, 1883. Report of State Board,
 1877. 28c
- WASHINGTON [D. C.] Department of Agriculture.
 Report of Commissioner, 1886-87. 28c
 Bulletin, 1, 9, 10, 13, 15-17, 41-43, 45-48. 28c
 Entomological Commission. 28b-d
 Annual Report, 1875, 1877-1885. 28b-d
 Report of Commissioner, 1871, 1886, 1887. 28d
 Report on Cotton Insects, 1879. 28d
 Bureau of Animal Industry.
 Report, 1885. 28d
 Animal Parasites of Sheep, 1890. 28d
- STATE COLLEGE [Penn.] Agricultural Experiment Station.
 Bulletin, Nos. 2, 4, 9, 10, 12. 28c

NON-SERIALS.

Pamphlets, 28a.

- ARENS, R. Die Thomasschlacke, ihre Analyse und Verwertung zu Landwirthschaftlichen Zwecken. Inaug. Diss. Jena, 1886.
- BESTYEREN, M. Beretning om Ladegaardsoens Hovedgaard for Aarne 1862 og 1863. Christiania, 1865. 28e
- BLOECK, R. Untersuchungen über die Produktionskosten der Getreidekörner. Inaug. Diss. Jena, 1888.
- CARMALT, W. H. On Abortion in Cows. Albany, 1869.
- DAHL, F. A. Om Torkehus for Korn. Christiania, 1867.
- GREGG, J. The Resources of the State of Oregon. (Prepared by the State Board of Agriculture, James Gregg, Sec.)
- GRESHOFF, M. Chemische Studien über den Hopfen. Inaug. Diss. Jena, 1887.
- HAESSNER, L. R. Untersuchungen über den Nahrstoffgehalt in den Wurzeln und Kornern der Gerste und Verhalten desselben zu den im Boden vorhandenen assimilirbaren Pflanzen-Nahrstoffen. Inaug. Diss. Jena, 1887.
- HILGARD, E. W. Root Knots on Fruit Trees and Vines.
- KNAUER, F. Untersuchungen über den Marktpreis des Heues u. dessen Verwendbarkeit zu landwirtschaftlichen Verausschlagungen. Inaug. Diss. Jena, 1889.
- KING, F. H. Observations and Experiments on the Fluctuations in the level and rate of Movement of Ground Water on the Wisconsin Agricultural Experiment Station Farm and at Whitewater, Wis. Weather Bureau Bulletin No. 5.
- LAPA, J. I. F. Memoria dos Trigos Portuguezes. Lisbon, 1865. 26b
- NIEBLING, R. Untersuchungen über die kunstliche Verdauung landwirtschaftlicher Futtermittel, nach Stutzer, über Pepsinwirkungen im Allgemeinen u. einen Versuch die Verdaulichkeit der Steinnusspalme festzustellen. Inaug. Diss. Jena, 1890.

- RICHARD, M. A. De la Conformation du Cheval. 28c
- ROHRER, R. Die Geschichtliche Entwicklung der Fruchtwech-
selwirtschaft. Inaug. Diss. Jena, 1889.
- SCHACHBASIAN, J. Untersuchungen über die Adhesion und
Reibung der Bodenarten an Holz u. Eisen. Inaug. Diss.
Jena, 1890.
- SCHUBELEB, F. C. Die Cultur-Pflanzen Norwegens. Chris-
tiana, 1862. 22c
- SEELHORST, C. von. Der Roggen als Wertmass für landwirth-
schaftliche Berechnungen. Inaug. Diss. Jena, 1888.
- WANKEL, G. Beretning om nogle landbrugschemiske Under-
sogelser ved Aas hoiere Landbrugskole. Kgl. Norske
Videnskabs-Selskabs Skrifter, vol. VI.
- WILLEMS, DR. Lungenseuche des Rindviehs. Die Annalen der
Landwirthschaft. Berlin, 1852.

ANTHROPOLOGY.

SERIALS.

- NUREMBERG [Germany] Festschrift zur Begrussung des
XVIII. Kongresses der Anthropologischen Ge-
sellschaft in Nurnberg. 25e
- PARIS [France] Societe d' Ethnographie.
Annuaire, 1876, 1878, 1882.
Actes. 1877 No. 2. 1873.
Bulletin 1884 No. 2. 25d
- RIO DE JANEIRO [Brazil] Archivos, Museu Nacional.
Anthropologia Brasileira. Vol. VI. + 26e
- WASHINGTON [D. C.] Bureau of Ethnology.
Introduction to Sign Language. 25e
Introduction to Mortuary Customs. 25e
Annual Report, 1880, 82, 83, 85, 86. + 25e

NON-SERIALS.

Pamphlets, 25e.

BRINTON, D. G. Contributions to a Grammar of the Muskokee Language.

— Grammar of the Choctaw Language.

— The National Legend of the Chahta-Muskokee Tribes.

FOERSTER, R. Die Physiognomik der Griechen. Kiel 1884.

HUBBARD, L. L. Some Indian Place Names in Northern Maine.

LIEBLEIN, J. Om en af H. M. Kongen til det ethnografiske Museum skjaenket aegyptisk Mumie. Christiania, 1890.

MASON, O. T. The Aborigines of the District of Columbia and the Lower Potomac. (Assisted by McGee, Mooney, Wilson, Proudfit, Holmes and Reynolds.) Amer. Anthropologist, vol. II., No. 3, pp. 225-268.

— Anthropology.

Amer. Naturalist. 1880, pp. 740-744, 813-818, 899-905; 1881, pp. 68-74, 151-161, 245-251.

SELER, E. Den altmexikanischen Federschmuck des Wiener Hofmuseums und uber mexikanische Rangabzeichen im Allgemeinen.

— Caracteres des Inscriptions Azteques et Mayas.

— Das Tonalamatl der Aubin'schen Sammlung und die Verwandten Kalenderbucher.

— Zur mexikanischen Chronologie, mit besonderer Berucksichtigung des zapotekischen Kalenders.

TERRY, J. Sculptured Anthropoid Ape Heads. Found in or near the Valley of the John Day River, a Tributary of the Columbia River, Oregon.

WASNER, G. Uber Siedelungen der Neger. Inaug. Diss. Konigsberg i. Pr. 1891.

- ZUCCARELLI, ANGELO. Per un Gabinetto Scuola di Antropologia Criminale Giambattista della porta da Fondarsi nell'Insegnamento libero di Napoli.
- Divorzio e Scienza. Antropologica conferenza pronunziata il 5 Febbraio 1893 a vantaggio del Gabinetto Scuola di Antropologia Criminale da Fondarsi nell' Insegnamento libero di Napoli.

ARCHEOLOGY.

SERIALS.

- CAIRO [Egypt] Institut Egyptien.
Bulletin Vol. III. No. 3, 1892. Fasc. 6. + 1e
- CHICAGO [Ill.] Am. Antiquarian, Vols. IV, Nos. 2-4; V, 1-5; VI, 6; VII, 1-6; VIII, 2-5; IX, 3-6. + 25d
- PHILADELPHIA [Penn.] Numismatic and Antiquarian Society. Report of Proceedings for years 1878, 79, 81-83, 85. 25c
- Notes upon Denarions of Augustus Cæsar, by H. Phillips. 25e
- Constitution and By-laws. 25e
- ROME [Italy] British and American Archeological Society of Rome, Vol., II. 12. + 25d
- ST. LOUIS [Missouri] St. Louis Academy of Science. Archæology of Mo., Part I. 26e
- WORCESTER [Mass] Worcester Society of Antiquity.
Constitution and By-laws. 25e
Proceedings, Foundation to 1877, 78-82, 84-90. + 25e
Papers: + 25e
Early Records of the town of Worcester.
Book II. 1740-1753.
Address of Carlton A. Staples, January 27, 1885.

WORCESTER [Mass.] Worcester Society of Antiquity.

Papers—continued.

The Abolitionists Vindicated in a Review of
Eli Thayer's paper on the New England
Emigrant Aid Company.

Inscriptions from the Old Burial Grounds in
Worcester, Mass., from 1727 to 1859.

—American Antiquarian Society.

Transactions, vols. I, III, -VIII. 25d

Catalogue, Partial Index. 25d

NON-SERIALS.

Pamphlets, 25d.

ADLER, C. Progress of Oriental Science in America during
1888. From Smithsonian Report for 1888. pp. 675-
702.

—Report of the Section of Oriental Antiquities in the U. S.
National Museum, 1888. From Smithsonian Report,
1887-88: Pt. II. pp. 93-104.

VAN BASTELAIR, D. A. Les Gres Wallons. Brussels,
1885. 25c

BRINTON, D. G. The Ancient Phonetic Alphabet of Yucatan.

CEULENEER, A. Type d' Indien du Nouveau Monde Represente
sur un Bronze Antique de Louvre.

DEICHMULLER, J. v. Ueber Urnenfunde in Uebigau bei Dresden.
Abh. der naturwissenschaftl. Gesellsch. "Isis" in Dres-
den, 1884. Heft II. pp. 1-8, 21-29.

—Ueber Gefasse mit Graphit-Malerei aus sachsischen Urnen-
feldern. Abh. d. naturwissenschaftl. Gesellsch. "Isis" in
Dresden, 1890, pp. 32-39.

GOTZE, A. Die Gefassformen u. Ornamenté der neolithischen
schnurverzierten Keramik im Flussgebiete der Saale.
Inaug. Diss. Jena, 1891.

- GRAVES, C. On the Croix Gamme, or Swastika. *Trans. of Royal Irish Academy*, vol. XXVII, No. 3. pp. 41-46.
- HICKS, E. L. The Collection of Ancient Marbles at Leeds. *Journ. of Hellenic Studies*, vol. XI. pp. 255-270.
- KNOETEL, P. *Die Figurengrabmalerei Schlesiens*. Inaug. Diss. Jena, 1890.
- Gold and Silver Ornaments from Mounds of Florida. *Amer. Antiquarian*, July, 1887. pp. 1-9.
- Gold Ornaments from the United States of Columbia. *Amer. Antiquarian*, Sept., 1887. pp. 267-270.*
- LIEBLEIN, J. *Die Aegyptischen Denkmäler in St. Petersburg, Helsingfors, Upsala, und Copenhagen*. Christiania, 1873.
- *Recherches sur la Chronologie Egyptienne d'après les listes Genealogiques*. Christiania, 1873.
- MARQUAND, A. An Archaic Patera from Kourion. [Plate VII.] *Amer. Jour. Archæology*, vol. IV, no. 2, pp. 1-3.
- A Phœnician Bowl in the Metropolitan Museum. *Amer. Jour. of Archæology*, vol. VII, nos. 1-2, pp. 1-6.
- - Reminiscences of Egyptian Doric Architecture. *Amer. Jour. Archæology*, vol. VI, nos. 1-2, pp. 1-16.
- A Silver Patera from Kourion. *Amer. Jour. of Archæology*, 1888; vol. III, pp. 1-17.
- MCGEE, W. J. An Obsidian Implement from Pleistocene Deposits in Nevada. *Amer. Anthropologist*, vol. II, no. 4, pp. 301-312.
- MORENO, E. P. *Museo de la Plata. Exploracion Arqueologica de la Provincia de Catamarca*. (Extracto del Informe Annal Correspondiente a 1890.)
- NUTZEL, H. *Münzen der Rasuliden nebst einem Abriss der Geschichte dieser Jemenischen Dynastie*. Inaug. Diss. Jena, 1891.

- OHLRICH, H. Die florentiner Niobegruppe. Inaug. Diss. Jena, 1888.
- PHILLIPS, H. A brief Account of the more important Public Collections of American Archæology in the United States.
- PHILLIPS, H. JR. Notes upon a Collection of Coins and Medals upon exhibition at the Penn. Museum and School of Industrial Art, Memorial Hall, Fairmount Park, Philadelphia. Proc. of Amer. Philosophical Soc., 1879, pp. 1-15.
- Remarks upon a Coin of Sicyon. Amer. Jour. of Numismatics, Jan., 1882, pp. 1-9.
- ROSNY, L. Essai sur le Dechiffrement de l'Écriture Hierarchy Maya. Archives de la Societe Americaine de France, vol. II, pt. 1, pp. 1-108.
- SALIN, B. Ue Dynr-och vaxtinotivens utvecklingshistoria. Upsala, 1890.
- STEVERSEN, L. B. Om et myntfund fra Imsland i Ryfylke. Christiania, 1889.
- UNDSET, I. Til kundskab om vor yngre jernalder. Christiania, 1890.
- Mere til kundstab om vor yngre jernalder. Christiania, 1890.
- Norske jordfundne oldsager i Nordiska Museet i Stockholm. Christiania, 1888.
- WHITE, C. A. Kjoekkenmoeddings de l'Amerique du Nord.
- YATES, L. G. Charm Stones, the So-Called "Plumets" or "Sinkers" of California. Bull. No. 2, Santa Barbara Society of Nat. Hist., 1890. pp. 13-28, plates 1-4.

ART.

NON-SERIALS.

Pamphlets, 30c.

- BERGNER, H. H.** Der gute Hirt in der altchristlichen Kunst.
Inaug. Diss. Jena, 1890.
- BRUNN, J.** Norges Stavkyrkor ett bidrag till dan Romanska
Arkitekturens Historia. Upsala, 1891.
- DEIKE, W.** Schiller's Ansichten uber die tragische Kunst
verglichen mit denen des Aristoteles. Inaug. Diss. Jena,
1891.
- FOERSTER, R.** Die Kunst in Schleswig-Holstein. Kiel, 1890.
- OHLRICH, H.** Die florentiner Niobegruppe. Inaug. Diss.
Jena, 1888.

ASTRONOMY.

SERIALS.

- ALBANY** [New York] Dudley Observatory.
Annals. Vol. II, 1862-71. 20c
- MADISON** [Wis.] Washburn Observatory.
Publications. Vols. V, VI, pts. 1, 2; VII,
pt. 1. 1886-89. + 20b
- MEXICO** [Mexico] Observatorio Astronomico Nacional.
Anuario, 1885, 89 (two copies) 91-93. 20c
Bulletin. Vol. I, No. 1-8, 9, 10. + 20e
- MT. HAMILTON** [Cal.] Lick Observatory.
Report of Trustees. 20e
Publications. Vol. I. (1887.) + 20e
Report-Eclipses. Total of sun Jan. and Dec. 89,
of moon July, 1888. 20e

- MUNICH [Germany] Royal Observatory.
Annals. Vol. XX. + 20c
- ST. PETERSBURG [Russia] Physikalisches Centralobservatorium.
Annalen, Jahrgang, 1874-81, 1883-90, 91. + 21e
- SANTIAGO [Chili] Observatorio Astronomico.
Reports, 1873-1881. + 20c
- SAN FRANCISCO [Cal.] Astronomical Society of the Pacific.
Publications, Vol. V, 28 (1893). + 20c
- TRIESTE [Austria] Osservatorio Marittimo di Trieste.
Rapporto Annuale, Vol. VII (1890) + 20e
- UPSALA [Sweden] Observatoire de l'Universite d'Upsal.
Bulletin, Vols. IV-IX, 1872-77. + 20e
- WASHINGTON [D. C.] U. S. Naval Observatory.
Annual Reports of Observations, 1853-60, 63,
64, 66, 68, 1872-87, 88. + 20d-e
- U. S. Naval Observations.
Appendix to Reports. 1876, App. I and III, I
Index of Publ., 1845-75; II Report solar
eclipses July, 78 and Jan., 80; 1884, App. I
Catalogue of stars, 1845-77; 1888, I Mono-
graph on Nebulae of Orion. + 20
Catalogue of Library, Pt. 1. Reports of Supt.,
1884, 87, 90. 20e
Report of Superintendent for 1891. + 23e

NON-SERIALS.

Pamphlets, 20c.

- BALL, R. S. Certain Problems in the Dynamics of a Rigid
System Moving in Elliptic Space. Trans. of Royal
Irish Academy, vol. XXVIII, no. IX, pp. 159-184.
- BOGART, J. Standard time for the United States of America,
Canada and Mexico. Published by A. S. C. E., 1882.

- BURNHAM, S. W. A Catalogue of Red Double Stars. Monthly Notices of Royal Astronomical Society for May, 1876, pp. 331-338.
- Seventh Catalogue of New Double Stars. Amer. Jour. Sci., vol. XII, pp. 1-4.
- Double Star Discoveries with the 18½ in. Chicago Refractor. Amer. Jour. Sci., vol. XIV, pp. 1-7.
- Double Stars Discovered by Alvan Clark. Amer. Jour. Sci., vol. XVII, pp. 283-289.
- Double Star Observations of years 1877-8. Chicago 1878. 20b.
- COMSTOCK, G. C. Provisional Results of a Determination of the Constant of Aberration.
- DIEFHANS, R. S. Polhohe von Kiel aus Zenithdistanzen des Polarsterns und aus Circummeridianhohen. Inaug. Diss. Kiel, 1892.
- FLEMING, S. Time-Reckoning for the Twentieth Century. Smithsonian Report, 1886, pp. 345-366.
- GEELMUYDEN, H. Christiania Observatoriums Polhoide, Christiania, 1888.
- GILBERT, G. K. The Moon's Face. Bulletin Philosoph. Society of Washington, vol. XII, pp. 241-292, pl. 3.
- HARING, G. H. History and Work of the Warner Observatory. Rochester, 1883-1886.
- HAUGHTON, S. New Researches on Sun-heat and Terrestrial Radiation, and on Geological Climates. (Parts 1 and 2.) Trans. of the Royal Irish Academy, vol. XXVIII, no. 6, pp. 47-98.
- HIRN, M. G. A. Resume des Observations Meteorologiques faites pendant l'annee 1884, en quatre points du Haut-Rhin et des Vosges. Comptes Rendus des Seances de l'Academie des Sciences, 1885.

HOLDEN, E. S. and HASTINGS, C. S. A Synopsis of the Scientific Writings of Sir William Herschel.

HUGO, C. L. Astronomie Geometrique ou Breves Considerations sur la nouvelle theorie des Ovhelites. Paris, 1876.

KNOFF, OTTO. Die Schmidt'sche Sonnentheorie und ihre Anwendung auf die Methode der spektroskopischen Bestimmung der Rotationsdauer der Sonne. Jena, 1893.

LUDERS, F. G. T. Das Nord- oder Polarlicht; wie es ist und was es ist.

—Das Gesetz der Wechselwirkung im Westars.

NATIONAL ACADEMY OF SCIENCE. Report of Eclipse Party to Caroline Island. Washington, 1883. 20b.

SAFFORD, T. H. The Development of Astronomy in the U. S.

SEELIGER, H. Ueber Allgemeine Probleme der Mechanik des Himmels. Munich, 1892.

STECHELT, C. Definitive Bestimmung der Bahn des Cometen 1881, IV. Inaug. Diss. Kiel, 1884.

TOWNLEY, S. D. Variable Stars of Long Period. Publications of the Astronomical Society of the Pacific, vol. IV, 1892.

TRAFFORD, F. W. G. Souvenir de l'amphiorama ou la vue du Monde pendant son passage dans une comete. Zurich, 1880.

WAR DEPARTMENT. Instructions for observing Transit of Venus, Dec. 6, 1882. Washington, 1882. 20b.

WASHINGTON UNIVERSITY ECLIPSE PARTY. Report of Total Eclipse of Sun, Jan., 1889. Norman, Cal., 1889. 20b.

BIBLIOGRAPHY.

SERIALS.

- ALBANY [N. Y.] New York State Library.
Annual Report, 1854-59, 62-66, 70-72, 91. + 23c
- AMSTERDAM [Holland] Bibliotheek Natura Artis Mag-
istra.
Catalogus. 25d
- Societe des Sciences Exactes et Naturelles.
Catalogue a prix Marques des Bibliotheques
formes par MM. le Dr. Matthes et le Dr.
Stamkart. 23
- CAMBRIDGE [Mass.] Library of Harvard University.
Bibliographical Contributions. Nos. 8, 12, 17, 19,
22, 26, 29, 30, 33-35, 37-44, 45. + 24b
- FRANKFURT a. O. [Germany] Societatum Litterarum.
(Herausgegeben v. Dr. Ernst Huth.) Jahrg., IV
(1890) 1-3. + 23
- HAARLEM [Holland] Fondation Teyler.
Catalogue de la Bibliotheque. Vol. I, pts 1, 2,
5-8; II, 1-3. + 23a
- LEIPZIG [Germany] Americana, by Karl W. Hiersemann.
Catalog, 70, 87, 89, 90, 97. 24b
- MADISON [Wis.] Wis. State Hist. Society.
Catalogue, 1873. Vols. I, II, pts 1 and 2. Suppl.
No. 1. 23b
- NEW YORK [New York] Astor Library.
Annual Report, 1884, 36. 23b
- ROME [Italy] Codici Panciatichiani.
Indici e Cataloghi. Vols. I, Nos. 1-3, 6-10;
II, 1-4. 23b
- WASHINGTON [D. C.] Bureau of Education.
Report, Condition and Management of Public
Library. Part 1, 1876. 23b
- Public Library.
Special Report. (1876) Part II. 23b

NON-SERIALS.

Pamphlets, 30b.

MASS. INST. OF TECHNOLOGY. Publications of. 1862-1887.
26c.

WADSWORTH, M. E. List of Publications of.

BIOGRAPHY

SERIALS.

RIO DE JANEIRO [Brazil] Brazilian Biographical Annual
by Joaquim Manoelde Macedo. Vols. I-III. 27d

NON-SERIALS.

Pamphlets, 27b.

BROCKHAUS, F. Nikolaus Falck, eine akademische Gedachtnissrede. Kiel, 1884.

FRAZER, P. Thomas Sterry Hunt. Amer. Geologist, vol. XI,
pp. 1-13.

HAUSHOFER, K. Franz von Kobell.

HJELT, O. E. A. Gedachtnissrede auf Alexander von Nordmann.

HYATT, A. Sketch of the Life and Service to Science of Prof.
Spencer F. Baird. Boston Soc. of Nat. Hist., vol.
XXIII, pp. 558-565.

JACKSON, M. M. Daniel Webster.

JAMES, J. F. Uriah Pearson James. Amer. Geologist, 1889,
pp. 1-7.

LEVASSEUR, E. La Vie et les Travaux de Wolowiski.

LORCK, A. Hermann von Salza, Sein Itinerar. Inaug. Diss.
Kiel, 1880.

PRATT, D. J. Biographical Notice of Peter Wraxall.

- REYNOLDS, S. A Biographical Sketch of the late Hon. Edmund Lovell Dana, President of the Osterhout Free Library. Wilkes-Barre, Pa., 1889.
- SHERMAN, S. S. A Biographical Sketch of Increase Allen Lapham, M. A. Milwaukee, 1876. 15b.

BIOLOGY.

SERIALS.

- BOSTON [Mass.]. The Marine Biological Laboratory.
Annual Report, No. 4. 4c
- GRANVILLE [Ohio]. Journal of Comparative Neurology,
Vol. I. pts. 1-4; II, pts. 1, 2. + 22a
- VIENNA [Austria]. Zoologisch-Botanische Gesellschaft.
Verhandlungen, Vols. XX, XXIII-XXXII. 6b

NON-SERIALS.

Pamphlets, 30e.

- ADERHOLD, R. Beitrag zur Kenntniss richtender Kräfte bei der Bewegung niedriger Organismen. Inaug. Diss. Jena, 1888.
- BROOKS, W. K. Salpa in its Relation to the Evolution of Life. Studies from the Biological Laboratory of the Johns Hopkins University, vol. V, No. 3.
- DAVID, A. Beitrag zur Kenntniss der Wirkung des chloresäuren Natriums. Inaug. Diss. Kiel, 1888.
- HAMMAR, J. A. H. Bidrag till Ledgangarnes Histologi. Upsala, 1892.
- HECKSTEDEN, E. Beitrag zur Lehre vom Echinokokkus. Inaug. Diss. Kiel, 1881.
- MARTENS, W. Ueber das Verhalten v. Vocalen u. Diphthongen in gesprochenen Worten. Inaug. Diss. Kiel, 1888.

- MAY, K. Ueber das Geruchsvermogen der Krebse nebst einer Hypothese uber die analytische Thatigkeit der Reichharchen. Inaug. Diss. Kiel, 1887.
- POLLI, GIOVANNI. Ricerche sulla cotenna del Sangue. Milan, 1843.
- ROMER, FRITZ. Ueber den Bau und die Entwicklung des Panzers der Gurteltiere. Inaug. Diss. Jena.
- SCHIEDEMANN, G. Ueber das Verhalten einiger Hydroxylaminverbindungen in Thierkorper. Inaug. Diss. Konigsberg, 1892.

BOTANY.

SERIALS.

- BASEL AND GENEVA [Switzerland] Schweizerische Botanische Gesellschaft. Berichte. Heft 1 (1891). + 22c
- CHRISTIANIA [Norway] University of Christiania. Die "Pflanzenwelt Norwegens." (2 copies.)
Die Culturpflanzen Norwegens. 1d
- COIMBRA [Portugal] Sociedade Broteriana.
Boletim. Vol. X. + 22d
- IOWA CITY [Iowa] State University of Iowa.
Bulletin from Laboratories of Natural History.
Vol. II. No. 3. + 22d
- KEW [England] Hooker's Icones Plantarum. Vols. XI-XX, XXI 1-3, XXII. (Ser. 3, Vols. I-X, Ser. 4, Vols. I. a-c II.) + 22d
- KONIGSBERG [Germany] Preussischer Botanische Verein in Konigsberg.
Jahresbericht, 1891-92. + 2c
- LONDON [England] Royal Horticultural Society.
Journal. Vol. 4, Nos. 14, 15 and 16. 1874. 22b

- LYON [France] Societe Botanique de Lyon.
Bulletin Trimestriel. Annee X. No. 4. 1892. + 22
- MILAN [Italy] Istituto Botanico dell' Universita di Pavia.
Series II, Vol. II. + 22
- MUNICH [Germany] Bayerische botanische Gesellschaft.
zur Erforschung der heimischen Flora.
Berichte, 1891. ± 22b
- NEW-YORK [N. Y.] Torrey Botanical Club.
Bulletin. Vols. IX, Nos. 1-8, 10-12, X-XIII,
1-8, 10-12; XIV-XVII, 1-7, 9-12;
XVIII-XIX, 2, 3, 6-8, 9. + 22a
- RIGA [Russia] Rigasche Garten-bau Verein.
Jahresbericht 14, 15. + 22a
- ST. LOUIS [Mo.] Missouri Botanical Garden.
Report. 1890-91, 92. + 22a
- ST. PETERSBURG [Russia] Royal Botanical Gardens.
Acta Horti Petropolitani. Vol. I-XII. + 22b
- STOCKHOLM [Sweden] Kongl. Svenska Vetenskaps Aka-
demiens.
Acta Horti Bergiani. Vol. I. + 22a
- TOULOUSE [France] Societe francaise de Botanique.
Revue de Botanique (Bulletin mensuel de la
societe) Vols. III-VII, XI, Nos. 121-126, [1884-
1888, 1893.] + 22e
- VIENNA [Austria] Garten-bau Gesellschaft in Wien.
Wiener Illustrierte Garten-Zeitung. 1892, June-
December. + 22c
- Zoologisch-Botanische Gesellschaft.
Verhandlungen. Vols. XX, XXIII-XXXII. 6b
- WEIMAR [Germany] Thuringischer botanische Verein.
Mittheilungen. Neue Folge. Hefts III and IV.
1893. + 22c

NON-SERIALS.

Pamphlets, 30c.

- ADLER, A. Untersuchungen ueber die Langenausdehnung der Gefassraume. Inaug. Diss. Jena, 1892.
- ARTHUR, J. C. Report of the Botanical Work in Minnesota for the year 1886. Bull. Geol. and Nat. Hist. Survey of Minn., No. 3.
- ATKINSON, G. F. An Automatic Device for Rolling Culture Tubes of Nutrient Agar Agar. Botanical Gazette, May, 1892, pp. 152-156.
- The Genus Frankia in the United States. Bulletin, Torrey Botanical Club, vol. XIX, pp. 171-177.
- Some Cercosporae from Alabama. Elisha Mitchell Scientific Society. Journal, vol. VIII, part 2, pp. 1-35.
- Carnation Diseases. Paper presented before the American Carnation Society at their annual meeting, 1893, at Pittsburgh.
- Method for obtaining pure Cultures of Pammel's Fungus of Texas Root Rot of Cotton. Botanical Gazette, vol. XVIII, pp. 17-20.
- Monograph of the Lemnaceæ of the United States. Annals of Botany, vol. IV, pp. 177-229, 1890.
- Some Diseases of Cotton. Agricultural Experiment Station of the Agricultural and Mechanical College, Auburn, Alabama. Bulletin, No. 41, Dec., 1892.
- BENECKE, WILHELM. Die Nebenzellen der Spaltöffnungen, ein Beitrag zur Kenntniss Ihres Baues und Ihres Function im Pflanzlichen Organismus. Inaug. Diss. Jena.
- BULL, A. J. Plechtige Herdenking van Linnæus Leven en Werken. Amsterdam, 1878.
- CARNEL, T. La Morfologia Vegetale. Pisa, 1878.
- Prodomo della Flora Toscana. Florence, 1864.
- Statistica Botanica della Toscana. Florence, 1871.

- CHAMBERLAIN, J. S. A Comparative Study of the Styles of Compositæ. Bull. Torrey Botanical Club, vol. XVIII, pp. 175-196, pl. 117-120.
- CHENEY, L. S. and TRUE, R. H. On the Flora of Madison and Vicinity. A Preliminary Paper on the Flora of Dane County, Wisconsin. Trans. Wis. Academy, Vol. IX. 1892.
- CLAUSEN, H. Beiträge zur Kenntniss der Athmung der Gewächse u. des pflanzlichen Stoffwechsels. Jena, 1890.
- COSTER, J. D. Linnæana. Amsterdam, 1878.
- CREPIN, F. Matériaux pour servir à l'histoire des Roses. Fascicules 3 and 4.
- Note sur le *Pecopteris Odontopteroides* Morris.
- DIETEL, P. Beiträge zur Morphologie u. Biologie der Uredineen. Inaug. Diss. Jena, 1887.
- FERNALD, M. L. The Portland Catalogue of Maine Plants. Proc. of Portland Soc. Nat. Hist., 1892, pp. 40-72.
- FICALHO, C. Flora dos Lusiadas. Lisbon, 1880.
- FUST, A. R. F. Culture du Tabac.
- GAMA, J. S. Clarsément Botanique de Plantes Alimentaires du Bresil. Paris, 1867.
- GISSLER, RUDOLF. Die Lokalisation der Oxalsäure in der pflanze. Inaug. Diss. Jena.
- GRAY, A. Memoranda of a Revision of the North American Violet. Botanical Gazette, vol. XI, no. 11, pp. 289-320, pl. 9.
- GREENE, EDW. L. Illustrations of West American Oaks from Drawings by Dr. Albert Kellogg. San Francisco, 1889. 22c.
- GREVILLIUS, A. Y. Anatomiska Studier ofver de Florala Axlarna hos Deklina Fanerogamer. Stockholm, 1891.

- HEDLUND, J. T. Kritische Bemerkungen über einige Arten der Flechtengattungen *Leconora* (Ach.), *Lecidea* (Ach.) u. *Micarea* (Fn.) Inaug. Diss. Upsala, 1892.
- HOFFMAN, F. Beiträge zur Kenntniss der Flora v. Central-Ost-Afrika, Inaug. Diss. Jena, 1889.
- JAMES, J. F. A Revision of the Genus *Clematis*. of the U. S. Jour. of Cincinnati Soc. of Nat. Hist., vol. VI, July, 1883.
- JONES, M. E. New Plants from Arizona, Utah, and Nevada. *Zoe*, vol. II, pp. 12-17.
- New Species and Notes of Utah Plants. *Zoe*, vol. II, No. 3, pp. 236-252.
- JUNGNER, J. R. Bidrag till Kannedomen om Anatomien hos Familjen *Dioscoreæ*, Upsala, 1888.
- KAURIN, C. Addenda et Corrigenda ad Enumerationem Bryinearum Dovrensiæ anctore. N. C. Kindberg. Christiania, 1889.
- KELLOGG, Dr. ALBERT. Illustrations of West American Oaks. (Text by Edw. L. Greene.) San Francisco, 1889, 22c.
- KIDDLER, J. H. Contributions to the Nat. Hist. of Kerguelen Island (Made in connection with the U. S. Transit of Venus Expedition, 1874-75), Washington, 1876.
- KINDBERG, N. C. Enumeratio Bryinearum Dovrensiæ. Christiania, 1888.
- KUCKUCK, P. Beiträge zur Kenntnis einiger *Ectocarpus* Arten der Kieler Fohrde. Inaug. Diss. Kiel, 1891.
- LAGER, D. S. Recherches Historique sur les mots Plantes Males et Plantes Femelles. Paris, 1884.
- LEONARD, E. J. Catalogue of Phaenogamous and Vascular Cryptogamous Plants found in Meriden, Conn. Meriden, 1885.
- LEMCKE, A. Beiträge zur Kenntnis der Gattung *Carex* Mich. Inaug. Diss. Königsberg, 1892.

- LIEBE, T. Grundriss der speciellen Botanik für den Unterricht an Höheren Lehranstalten.
- LOUREIRO, J. Flora Cochinchinensis, vols. I, II. 22c,
- MESTON, A. Report of the Government Scientific Expedition to Bellenden-ker Range upon the Flora and Fauna of that part of the colony.
- MIELKE, G. Anatomische u. physiologische Beobachtungen an den Blättern einiger Eucalyptus-Arten. Inaug. Diss. Jena, 1891.
- MULLER, K. Vergleichende Untersuchung der Anatomischen Verhältnisse der Clusiaceen, Hypericaceen, Dipterocarpaceen u. Ternstroemiaceen. Inaug. Diss. Kiel, 1882.
- OUDEMANS, C. A. J. A. Carolus Linnæus. Amsterdam, 1878
- PAMMEL, L. H. On the Structure of the Testa of Several Leguminous Seeds. Bull. Torrey Bot. Club, 1886, Feb., pp. 17-24, pls. 52 and 53.
- Weeds of Southwestern Wisconsin and Southeastern Minnesota. St. Paul, 1887.
- PEARSON, W. H. Frullaniæ Madagascariensis præcipue collectionibus Borgeni. Christiania, 1891.
- PECK, C. H. Fungi. Trans. Alb. Inst., 1870.
- POLAKOWSKI, H. La Flora de Costa Rica. San Jose. 1891.
- RHEIN, G. F. Beiträge zur Anatomie der Cæsalpiniaceen. Inaug. Diss. Kiel. 1888.
- SANDOVAL, V. L. Beitrag zur Kenntniss der Gattung Roxburghia. Inaug. Diss. Strassburg. 1892.
- SCHONLAND, S. Ueber die Entwicklung der Blüten u. Frucht bei den Platanen. Inaug. Diss. Kiel. 1883.
- SCHUBELER, F. C. Die Culturpflanzen Norwegens. Christiania. 1861. 22c,
- Die Pflanzenwelt Norwegens. Christiania. 1875. 22c.

- CHUBELER, F. C. Pflanzengeographische Karte über das Königreich Norwegen. Christiania.
- Vaextliøet i Norge, med særligt hensyn til Plantegeographien. Christiania. 1879.
- SCRIBNER, F. L. The Ornamental and Useful Plants of Maine.
- SEIDEL, C. Beiträge zur Anatomie der Saxifrageen. Inaug. Diss. Kiel. 1890.
- SKARMEN, J. A. O. Om Salixvegetationen i Klarefoens Floddal. Upsala. 1892.
- STENSTROM, K. O. E. Varmlandska Archieracier anteckningar til Skandinaviens Hieracium-Flora. Upsala. 1879.
- STENZEL, G. Blütenbildungen beim Schneeglöckchen (*Galanthus Nivalis*) und Samenformen bei der Eiche (*Quercus Pedunculata*). Cassel. 1890. 22c.
- STENZEL, K. G. Untersuchungen über Bau und Wachstum der Farne. Theile I u. II. Verhandlung der Kaiserl. Leopold-Carol. deutschen Akademie der Naturforscher, vol. XXVIII.
- Über Farn-Wurzeln aus dem Rothen-Liegenden. Verhandlungen der Kaiserl. Leopold-Carol. deutschen Akademie der Naturforscher, vol. XXVI, pt. 1.
- Über eine merkwürdige Rinden-Bildung bei der Edeltanne.
- Mittheilungen über zweizahlige Orchideenblüthen.
- Gefasskryptogamen.
- Über Fruchtformen des Ahorns.
- STROEVER, V. Ueber die Verbreitung der Wurzelverkürzung. Inaug. Diss. Jena. 1892.
- TRELEASE, W. The Species of *Rumex* Occurring North of Mexico. 3rd Annual Report of the Mo. Botanical Garden, 1892.

- VERBRUGGE, W. A. V. Openingsplechtigheid van de Tentoonstelling.
- VOIGT, A. Localisirung des atherischen Oeles in den Geweben der Allium-Arten. Inaug. Diss. Jena. 1889.
- WATERMANN, R. W. Third Biennial Report of the California State Board of Forestry for the years 1889-90.
- WEISS, J. E. Die Bayerische botanische Gesellschaft zur Erforschung der heimischen Flora und ihre Organization. Leimbach's Deutscher Botanischer Monatschrift, vol. VIII, No. 3.

CHEMISTRY.

SERIALS.

- VIENNA [Austria] Allgem. osterr. Chemiker- u. Techniker-Zeitung, Jahr. XI, Nos. 13-14 + **30b**
- BOSTON [Mass] Boston Journal of Chemistry, Vols. XII, 1-11, 15, 17; XIII, 1, 3-5, 8, 9; XIV, 1, 4, 5, 7, 8; XV, 1, 3-6, 8, 12; XVI, XVII, 1, 3. **30c**

NON-SERIALS.

Pamphlets, **21c**.

- ABEL, J. Ueber Aethylenamin (Spermin?). Inaug. Diss. Kiel. 1888.
- ABENIUS, V. Undersokningar, in om Piazinserien. Upsala, 1891.
- ALTSCHUL, J. Ueber Versuche zur Synthese v. Oxychinolincarbon-sauren u. uber die dabei erhaltene Paraoxychinolincarbon-saure. Inaug. Diss. Jena, 1888.
- ARENS, R. Die Thomasschlacke, ihre Analyse u. Verwertung zu Landwirtschaftlichen Zwecken. Inaug. Diss. Jena, 1886.

- ARNHOLD, M. Zur Kenntniss des dreibasischen Ameisensaureathers u. verschiedener Methylale. Inaug. Diss. Jena, 1886.
- BACHER, F. Ueber Methyl- u. Dimethyl-derivate des Pyridins. Inaug. Diss. Kiel. 1889.
- BACHMANN, G. Ueber einige Einwirkungsproducte v. Alkyljodiden auf Nitropropan. Inaug. Diss. Jena. 1889.
- BAURATH, H. Ueber α -Stilbazol u. seine Reductionsproducte. Inaug. Diss. Kiel, 1888.
- BERTRAM, PAUL. Ueber die Einwirkung von Salpetersaure auf Phenylmethylpyrazolon. Inaug. Diss. Jena.
- BOGDAHU, F. Ueber Phenylglycolenyldioxytetrazotsaure u. einige Abkommlinge derselben. Inaug. Diss. Königsberg, 1892.
- BOTTIGER, E. Ueber die Einwirkung v. Chlorkalk auf Benzidin u. Homologe. Inaug. Diss. Jena. 1881.
- BRUGGEMANN, R. Ueber die einwirkung v. Natrium auf den Aethylather der normalen u. der Iso-Buttersaure. Inaug. Diss. Jena, 1888.
- BUNGE, G. Ueber Xylenolcarbonsauren u. einige Condensationsproducte, welche der Euxanthongruppe angehören. Inaug. Diss. Jena. 1889.
- BURWELL, A. W. Ueber die Einwirkung v. Natriumaethylat auf Isopropylparaconsaureaethylester. Inaug. Diss. Strassburg. 1892.
- CAMERON, C. A. On some hitherto Undescribed Compounds of Selenium. Trans. of Royal Irish Academy, vol. XXVIII, no. VIII, pp. 137-158.
- CHARLAMBOFF, L. Synthetische Versuche in der Oxalsaurereihe. Ueber α -Methylghitarsaure. Inaug. Diss. Jena. 1889.
- CHITTENDEN, R. H. and SMITH, H. E. The Diastatic action of Saliva, as Modified by various conditions, Studied Quantatively. Trans. Conn. Academy, vol. VI, pp. 343-376.

- CLUTTERBUCK, M. C. On Tetrolic Acid. Inaug. Diss. Strassburg, 1891.
- COHEN, E. Ueber die Trennung von Thonerde, Eisenoxyde und Titansaure. Neues Jahrbuch für Mineralogie, etc, 1884. vol. I, pp. 186-187.
- COLVIN, V. On certain New Phenomena in Chemistry. Read before Albany Institute, 1872.
- COSACK, J. Derivate der Toluidine. Inaug. Diss. Kiel.
- DICKHUTH, MAX. Ueber einige Indigo-Derivate. Inaug. Diss. Jena. 1893.
- DUDEN, PAUL. Beiträge zur Theorie der Pyrazolbildung. Inaug. Diss. Jena, 1892.
- EIDAM, MAX, Ueber die Einwirkung des Diacetbernsteinsäureesters auf Hydrazobenzol, symmetrisches Methylphenylhydrazin und Hydrazinhydrat. Inaug. Diss. Jena.
- ELBEL, K. Ueber einige Derivate der Opiansäure. Inaug. Diss. Kiel. 1887.
- ENKE, E. Ueber Alkyloxy-Quartenylsäure-Aether. Inaug. Diss. Jena, 1889.
- FAJANS, A. Monomethylorthodioxybenzylcarbonsäuren und deren Derivate. Inaug. Diss. Jena, 1890.
- FOGH, J. Ueber die chemischen Vorgänge bei der Elektrolyse von wässrigen Chloridlösungen. Inaug. Diss. Jena, 1889.
- FRANKE, F. Ueber die Condensation v. Acetessigester u. β -Naphthylamin. Inaug. Diss. Jena, 1891.
- FRITZSCHEN, E. Ueber Halogenderivate der Pyrazolonreihe. Inaug. Diss. Jena, 1892.
- GABBA, L. Sopra alcuni Recenti Studj di Chimica Organica e sull' applicazione dei loro risultati all' arte tuitoria.
- GENNINOS, V. Tratado de Vinificacao, Lisbon, 1868.

- GENTHER, TH. Zur Kenntnis des Nitroso-Antipyrins. Inaug. Diss. Jena, 1893.
- GOTTING, G. Beiträge zur Kenntniss der Constitution des Nitroäthans. Inaug. Diss. Jena, 1887.
- GOTTSCH, H. Ueber Pyridinderivate aus Propionaldehydamoniak u. Propionaldehyd. Inaug. Diss. Kiel, 1890.
- GRABOWSKI, G. Ueber die Einwirkung salpetriger Säure auf einige Amidine u. über β -Naphtenylamidin. Inaug. Diss. Königsberg, 1892.
- GRAM, JOHANN F. Ueber einige Derivate des p-Diamidodiphenylmethans. Inaug. Diss. Jena.
- GRESHOFF, M. Chemische Studien über den Hopfen. Inaug. Diss. Jena, 1887.
- GROTHER, O. Ueber die Metajodorthonitro u. Amido Benzoesäuren, sowie über isomere Nitrobenzylcyanide u. Paranitrophenyllessigsäure. Inaug. Diss. Kiel, 1880.
- GRUNHAGEN H. Einwirkung v. Methylenchlorid auf Para u. Orthotoluidin. Inaug. Diss. Jena, 1889.
- GRUMWALD, H. Ueber einige Methoden zur quantitative Bestimmung des Glycerins. Inaug. Diss. Jena, 1889.
- HÄHLE, H. Ueber Metanitroparaamidophenol u. einige Derivate desselben. Inaug. Diss. Jena, 1889.
- HANSDORFF, G. Das Wurmsamenöl. Inaug. Diss. Jena, 1886.
- HARTENSTEIN, Max. Ueber α -Hydronaphtochinon und einige Derivate desselben. Inaug. Diss. Jena.
- HAWKINS, E. N. Report on the Technical Determination of Zinc. Proc. of Colorado Scientific Society, 1892, pp. 1-20.
- HEADDEN, W. P. The Production of Columbus & Tungstous Oxides in Forming Compounds of Iron and Tin. Proc. of Colorado Scientific Society. Jan. 2nd, 1893.
- HECTOR, D. S. Undersökningar öfver Svafvelurinämnes Forhallande till Oxidationsmedel. Upsala, 1892.

- HELLSTROM, P. Studier ofver Naftalinderivat. Upsala, 1890.
- HERBIG, W. Beitrage zur Glycerinbestimmung. Inaug. Diss. Jena, 1890.
- HERZFELD, J. Ueber Abkommlinge des Toluchinolins. Inaug. Diss. Jena, 1886.
- HILBERT, H. Ueber die Einwirkung v. Methylenchlorid auf Roh- und α -Picolin. Inaug. Diss. Jena, 1889.
- HINRICHSSEN, W. Ueber m-Xylobenzylamin. Inaug. Diss. Kiel, 1889.
- HOFFMANN, T. Ueber die Umwandlung der Phenyl- $\beta\gamma$ -pentensaure (Cinnamenylpropionsaure) in Phenyl- β -pentensaure. Inaug. Diss. Strassburg, 1892.
- HOHLAND, R. Ueber einige Substitutionsproducte des Methylenchlorids. Inaug. Diss. Jena, 1886.
- HOSAENS, H. Beitrag zur Kenntniss der β -Oxynaphtoesaure. Inaug. Diss. Jena, 1892.
- HUNDT, C. Ueber die Darstellung optisch aktiver Tropasauere u. optisch aktiver Atropine. Inaug. Diss. Kiel, 1890.
- JAEHNE, O. Beitrage zur Kenntniss Phosphorigsaure Alkylverbindungen. Inaug. Diss. Jena, 1889.
- JENSSEN, E. Beitrage zur krystallographischen Kenntnis organischer Verbindung. Inaug. Diss. Leipzig, 1889.
- JENTZSCH, A. Ueber ein Einwirkungsproduct v. Kohlenoxydchlorid auf Diamidoazobenzol u. einige Derivate desselben. Inaug. Diss. Jena, 1888.
- KEMPF, C. Ueber die Einwirkung des Benzylamins auf das Methylenchlorid. Inaug. Diss. Jena, 1889.
- KIRSCHNICK C. Ueber Paratolenyldioxytetrazotsaure u. ihre an Sauerstoff armeren Derivate. Inaug. Diss. Konigsberg, 1892.
- KLABUNG, H. Ueber die physikalische Isomerie einiger Hydroxylamin Derivate mit dem Radical der Paratoluylsaure. Inaug. Diss. Konigsberg, 1891.

- KNIEP**, W. Ueber Trennungsmethoden des Bariums, Strontiums, u. Calciums. Inaug. Diss. Jena, 1889.
- KNIGHT**, F. C. A Volumetric Method for the Determination of Lead.
- KOLL**, A. Zur Kenntniss einiger Chlorcrotonsauren. Inaug. Diss. Jena, 1888.
- KONIG**, K. Ueber die Einwirkung v. Schwefelsaure auf α -Oxy-naphtoesulfosauren. Inaug. Diss. Jena, 1890.
- KONIG**, W. Ueber das Verhalten einiger Oxychinaldine gegen Kohlensaure u. ueber die o-Oxychinaldincarbonsaure. Inaug. Diss. Jena, 1889.
- KRANTZ**, F. Krystallographische Untersuchungen von Nitrolaminbasen und verwandten Korpern. Inaug. Diss. Leipzig, 1888.
- KRANZ**, L. Ueber die Einwirkung v. Chlorkohlenoxyd u. Kohlensaure auf einige Oxybenzole. Inaug. Diss. Jena, 1891.
- KREY**, WALTHER. Ueber einige Condensationsproducte des Antipyrins mit Aldehyden. Inaug. Diss. Jena.
- KROBER**, T. Ueber Derivate des ortho- u. para-Tolubenzylamins. Inaug. Diss. Kiel, 1890.
- KUNZE**, H. Beitrage zur Kenntniss der Isocarbopyrotritsaure aus Diacetbernsteinsaureester. Inaug. Diss. Jena, 1892.
- LAPA**, J. I. F. *Chimica Agricola*. 30c.
- LAUN**, W. F. Beitrage zur Kenntniss der Alkine. Inaug. Diss. Kiel, 1884.
- LINDEMANN**, T. Ueber einige neue Salze des Antipyrins u. ueber die Einwirkung v. Epichlorhydrian auf Phenole. Inaug. Diss. Jena, 1891.
- LORENZ**, R. Beitrage zur Kenntniss der Valenz des Bor's. Inaug. Diss. Jena, 1888.
- MERCK**, C. E. Ueber Furfurathenpyridin u. ueber Cocain. Inaug. Diss. Kiel, 1888.

- MEWES, W. Ueber einfach- und gemischt halogen- substituirt
Acetessigester sowie uber ihr Verhalten zu Natriumal-
koholat. Inaug. Diss. Jena, 1887.
- MEYER, G. Ueber einige kunstliche u. natuerliche Alkaloide.
Inaug. Diss. Konigsberg.
- MEYERS, H. C. Ueber Dichlormethylparaconsaure. Inaug.
Diss. Strassburg, 1891.
- MOLLENHOFF, C. Ueber Sulfosauren des Phenylmethyl-Pyrazo-
lons und seiner Derivate. Inaug. Diss. Jena, 1891.
- MORITZ, H. Ueber dimethylirtes Methyluracil. Inaug. Diss.
Jena, 1887.
- MOWBRAY, G. M. Nitro-Glycerine, as used in the Construction
of the Hoosac Tunnel.
- MULLER, MAX. Zur Kenntniss von Pyrazolonderivaten aus
 β -Naphtylhydrazin. Inaug. Diss. Jena.
- MUNSCH, A. Das. Hexylen, seine bromirten Derivate und
deren mogliche geometrischen Isomeren. Inaug. Diss.
Jena, 1890.
- MUNSTER, C. A. Kongsbergsolvat sammensaetning og en
sekundaerproces ved dets dannelse. Christiania.
- NEUMANN, G. S. Schwefelsaure als Jodubertrager. Inaug.
Diss. Jena, 1887.
- NICKEL, E. Die Farbenreactionen der Kohlenstoff verbin-
dungen. I Theil. Farbenreactionen mit aromatischem
Charakter. Inaug. Diss. Jena, 1888.
- NOAH, E. Zur Kenntniss der Oxyanthrachinone. Inaug. Diss.
Jena, 1887.
- OELSCHLAGEL, C. Ueber das Pseudo-Ephedrin. Inaug. Diss.
Kiel, 1890.
- OLDACH, H. Ueber eine Synthese β -Methyltetramethylen-
diamins und das β -Methylpyrolidins. Inaug. Diss.
Kiel, 1887.

- PAESSLER, J. Ueber Engetinsäure und einige Derivate derselben. Inaug. Diss. Jena, 1889.
- PALM, G. Ueber die Einwirkung von Chlorkohlenoxyd auf Nitroamidophenol. Inaug. Diss. Jena, 1890.
- PALMER, C. S. The Nature of the Chemical Elements. Proc. of Colorado Scientific Society, 1892.
- PARKER, J. G. Ueber neue Synthesen mit Brenztraubensäure, Inaug. Diss. Strassburg, 1891.
- PARSOW, H. Ueber die Einwirkung v. Paratoluidin auf Acetessigester. Inaug. Diss. Jena, 1891.
- PERLSTEIN, M. Ueber einige aromatische Verbindungen mit ungesättigten Seitenketten. Inaug. Diss. Jena, 1889.
- PINGLE, C. Ueber den Propio-propionsäuremethyläther. Inaug. Diss. Jena, 1887.
- PLATH, G. Ueber β -Aethyl- α -Stilbazol u. einige seiner Derivate. Inaug. Diss. Kiel, 1889.
- PRITZKOW, A. Ueber Einige Derivate des o-Tolylmethylpyrazolons. Inaug. Diss. Jena, 1891.
- RANTERBERG, F. Ueber Benzophenonhydrazin und einige Derivate desselben. Inaug. Diss. Kiel, 1891.
- REBS, H. Untersuchung über Schwefelverbindungen. Inaug. Diss. Jena, 1888.
- REHER, L. Ueber Aethylderivate des Chinolins. Inaug. Diss. Kiel, 1887.
- ROSENGARTEN, GEORGE D. Ueber die Einwirkung von Acetylacetessigester und Aethylidenacetessigester auf Hydrazinhydrat. Inaug. Diss. Jena.
- ROSSLER, E. Ueber die Oxathylamine. Inaug. Diss. Jena.
- ROSUMOFF, P. Ueber das α -Methyl-Pyridylketon. Inaug. Diss. Jena, 1889.

- ROTH, F. Ueber Tropeine u. Glycoline. Inaug. Diss. Kiel, 1883.
- ROTHENBURG, R. Ueber (3) Phenylpyrazolon. Inaug. Diss. Kiel, 1892.
- RUDOLF, F. Ueber die Einwirkung von Chlorkohlenoxyd auf Pikraminsäure. Inaug. Diss. Jena, 1892.
- SAGGAN, T. Ueber das β -Aethylpyridin und β -Aethylpiperidin. Inaug. Diss. Kiel, 1892.
- SCHALL, C. Einwirkung v. Tetrachlorkohlenstoff auf die drei isomeren Kresole u. Oxydation der daraus entstehenden Oxyloylsäuren zu Oxyphthalsäuren. Inaug. Diss. Kiel, 1881.
- SCHIMMEL, C. Ueber die Einwirkung v. Methylenchlorid auf Pyridin. Inaug. Diss. Jena, 1889.
- SCHLANGK, M. Ueber synthetische Pyridinbasen aus Acet- u. Propionaldehydammoniak. Inaug. Diss. Kiel, 1888.
- SCHMIDT, F. Ueber die Einwirkung v. einigen Saurechloriden auf Natriumphenylhydrazin. Inaug. Diss. Jena, 1888.
- SCHNEIDER, P. Ueber Paratolenyloxytelrazotsäure. Inaug. Diss. Königsberg, 1892.
- SCHOFER, G. Einwirkung von Hydrazinhydrat auf einige Ester der Fettsäurereihe. Inaug. Diss. Kiel, 1892.
- SCHRADER, L. Ueber Isopropyl-derivate des Pyridins u. Reducionsproducte desselben. Inaug. Diss. Kiel, 1884.
- SCHRAMM, C. Synthetisch Untersuchung in der Chinolinreihe. Inaug. Diss. Kiel, 1887.
- SCHULTZ, H. C. M. Ueber α -Methyl- α -Aethyl- und α -Methyl- γ -Aethylpyridin und ihre zugehörigen Hexahydrobasen. Inaug. Diss. Kiel, 1888.
- SCHWIMMER, M. Pyrazolderivate entstanden durch Einwirkung v. Isobutyryl u. Isobutylidenacetessigester auf Phenylhydrazin. Inaug. Diss. Jena, 1892.

- SCHWAN, N. Hydrazinhydrat und substituierte Glycolsäureester. Inaug. Diss. Kiel, 1892.
- SEIDEL, P. Ueber einige Derivate aus den Reihen des Carboxyl-o-amidophenols u. des Thiocarb-o-amidophenols. Inaug. Diss. Jena, 1889.
- SESSL, J. Beiträge zur Kenntniss der Ketonensäuren. Inaug. Diss. Jena, 1888.
- STENZEL, G. Chemische Erscheinungen.
- STOERMER, M. Ueber sogenannte physikalisch verschiedene Modificationen von Hydroxylaminderivaten. Inaug. Diss. Jena, 1892.
- STRUBE, G. Ueber das Benzoylhydrazin u. einige Derivate desselben. Inaug. Diss. Kiel, 1891.
- TAUFKIRCH, H. Ueber führung des Antipyrins in das β -Methylamidokrotonsäureanilid. Inaug. Diss. Jena, 1893.
- TREBST, O. Einwirkung v. Methylchlorid auf Piperidin. Inaug. Diss. Jena, 1890.
- UECKER, A. Beiträge zur Kenntniss der physikalischen Isomerie einiger analysirter Hydroxylaminderivate. Inaug. Diss. Königsberg, 1891.
- VEHSE, A. Ueber die Einwirkung v. Phenylhydrazin auf Cinnamylacetessigester. Inaug. Diss. Jena, 1891.
- VESTERBERG, K. A. Kemiska Studier ofver Nagra Hartser. Upsala, 1890.
- VOGEL, H. Ueber die Einwirkung v. p- u. o- Toluidin auf Dibrombernsteinsäureäthylester. Inaug. Diss. Jena, 1890.
- WANGENHEIM, G. Ueber die Einwirkung v. Diacetbernsteinsäureester auf Ortho- u. Para- Tolyhydrazin. Inaug. Diss. Jena, 1891.
- WISKIRCHEN, P. Modificationen alkylierter Dibenzhydroxamsäureester u. alkylierter Benzhydroxamsäuren. Inaug. Diss. Königsberg, 1892.

- WITTING, F. I. Darstellung zweier isomerer Xylolsulfosauren
II. Zur Kenntniss der Parasulfamidobenzoesaure. Inaug.
Diss. Jena, 1888.
- ZAERTLING, R. Ueber einige Derivate des Nitro- β -Naphtho-
chinons. Inaug. Diss. Jena, 1890.
- ZAHN, G. H. Ueber die Vorgänge an der Uebergangsstelle
eines elektrischen Stromes zwischen Elektrolyten in ver-
schieden Konzentrirten Losungen. Inaug. Diss. Strass-
burg, 1892.
- ZIEGENBRUCH, L. Ueber die Einwirkung der Aldehyde auf
Phenylmethylpyrazolon. Inaug. Diss. Jena, 1891.

ECONOMICS AND POLITICAL SCIENCE.

SERIALS.

ST. PETERSBURG [Russia] Kaiserliche Freie Okonomi-
sche Gesellschaft.

Mittheilungen. 1855-63.

26d

NON-SERIALS.

Pamphlets 27c.

- BLASS, F. Die socialen Zustände Athens im 4ten Jahrhundert v.
Christus. Kiel, 1885.
- CURTIS, G. W. Officers and Members of the American Social
Science Association for 1874.
- DIPPE, O. Gefolgschaft u. Huldigung im Reiche der Merowin-
ger. Inaug. Diss. Kiel, 1889.
- ECKERT, H. Die Wirkung der Verschuldung v. Landgutern und
die nach wirtschaftlichen Grundsätzen zulässige Höhe der
hypothekarischen Belastung. Inaug. Diss. Jena, 1888.

- ERWIN, C. K., Hooker, C. E. & Feld, C. R. Report of Committee on the subject of Convict Labor made to Legislature Jan. 18, 1889.
- GILDEMEISTER, H. Das deutsche Volksleben in XIII. Jahrhundert nach dem deutschen Predigern Bertholds v. Regensburg. Inaug. Diss. Jena, 1889.
- HIRAI, M. Uber die landwirtschaftlichen Verhaltnisse Japans mit Berucksichtigung der Grundsteuer und des landwirtschaftlichen Kredites. Inaug. Diss. Jena, 1890.
- KARMPFE, E. J. H. Die Lage der industrielle thatigen Arbeiterinnen in Deutschland. Inaug. Diss. Jena, 1889.
- LACKNER, C. Darstellung der wirtschaftlichen u. socialen Verhaltnisse einer Ostpreussischen Landgemeinde. Inaug. Diss. Jena, 1889.
- McENVOY, J. M. The Toronto Township. Toronto University Studies in Political Science. Series I. No. 1.
- MEYER, GEORG. Ueber die Schwankungen in dem Bedarf an Handarbeit in der deutschen Landwirtschaft und die Moglichkeit ihrer Ausgleichung. Inaug. Diss. Jena, 1893.
- PHILLIPS, H. An Account of the Congo Independent State. Proc. Amer. Phil. Soc. vol. XXVII. pp. 459-476.
- RINKE, CARL. Ueber den Einfluss der Valutawerth-Schwankungen auf den auswartigen Handel. Inaug. Diss. Jena, 1893.
- SEELHORST, C. von. Die Belastung der Grundrente durch das Gebaudekapital in der Landwirtschaft. Jena, 1890.
- SMALL, A. W. Dynamics of Social Progress. Proc. of 6th Annual Meeting of the Amer. Institute of Instruction. 1889, pp. 1-18.
- WARNER, A. G. Report of Superintendent of Charities for District of Columbia for year ending June 30, 1892.

EDUCATION.

SERIALS.

- ALBANY [N. Y.] University of State of New York.
Annual Report of Regents, 1872, 74-84, 87-90. + **23**
- BALTIMORE [Maryland] Johns Hopkins University.
Register for 1890-91, 1891-92. + **26b**
- CARLSRUHE [Germany] Polytechnische Schule.
Programm, 1872, 77-79. + **30c**
- CASSEL [Germany] Realschule.
Programm, 1858-61, 63-70, 73, 74, 76, 77, 79-92. + **30c**
- HANOVER [Germany] Konigliche Polytechnische Schule.
Programm, 1871-72, 74-79, 81, 85. + **31c**
- LOUVAIN [France] Universite Catholique de Louvain.
Annuaire, 1883-92. + **27a**
- MADISON [Wisconsin] Laws Relating to Common Schools
including Township and Free High Schools. **28c**
—Laws of Public Schools of Wisconsin, 1873. **26b**
- PARIS [France] Ministere de l'Instruction Publique.
Catalogue. Vols. I-III. + **27a**
- SIDNEY (NEW SOUTH WALES), [Australia] University of
Sidney.
Calendar for the years 1891 and 1892. + **26b**
- UPSALA [Sweden] Kongl. Universitet i Upsala.
Forelasningar och Oefningar, 1889, 1890. + **30c**
- WASHINGTON [D. C.] Department of Education.
Report of Commissioner, 1884. **28e**
—Bureau of Education.
Circulars of Information, 1875, Nos. 5-7, 1886, 2. **28e**

NON-SERIALS.

Pamphlets, 26a.

- CHAMBERLIN, T. C. The Coming of the Age of State Universities.
- HEDENIUS, M. Constitution of University of Upsala. Upsala, 1890.
- HENSEN, V. Die Naturwissenschaft im Universitätsverband. Kiel, 1887.
- POPE, A. A. Errors in School Books.
- REINKE, J. Die Preussischen Universitäten im Lichte der Gegenwart. Kiel, 1891.

ENGINEERING.

SERIALS.

- ANN ARBOR [Michigan] Engineering Society of Ann Arbor.
- | | |
|----------------------------|-----|
| The Technic, 1891, 1892. + | 20b |
|----------------------------|-----|
- BOSTON [Mass.] Mass. Institute of Technology.
- | | |
|--|-----|
| Proceedings of Society of Arts, 1880-90. + | 20b |
| Technology Quarterly, Vols, I, Nos. 2-4; II, 1-4; III, IV. + | 20b |
| Annual Catalogue, 1890-91. | 20b |
| Annual Report, 1891. | 20b |
| List of Publications, 1862-87. | 20b |
- CHAMPAIGN [Illinois] University of Illinois.
- | | |
|-----------------------------------|-----|
| The Technograph, 1890 and 1891. + | 20a |
|-----------------------------------|-----|
- Civil Engineers Club of University of Illinois.
- | | |
|-----------------------------------|-----|
| Selected Papers, 1887 and 1888. + | 20a |
|-----------------------------------|-----|

- CHICAGO [Illinois] Association of Engineering Societies.
Journal (Trans. and Proceedings), Vols. I, Nos.
5-12; II-VI, VII 1-6, 9-12; VIII-X, XI, + 20a
- NEWCASTLE [England] North of England Mining and
Mechanical Engineers.
Transactions, Vols. XII-XVII, XXIII-XXX,
XXXI, pts. 1-3; XXXIV, 1-6; XXXV, 1-3;
XXXVI, 2-4; XXXVII, 1-6; XXXVIII, 1-6;
XXXIX, 1; XL, 1-4. + 18ab
Index to Vols. I-XXV (1852-76). 18a
- Northumberland and Durham Borings and Sink-
ings, Part I, a-b; II, c-e; III, f-k. 18b
- Council of Mining and Mechanical Engineers.
Reports, 1890-91. Parts. 1-3. + 18b

NON-SERIALS.

Pamphlets, 20a.

- ALEXANDER, T. On Two-nosed Catenaries and Their applica-
tion to the Design of Segmental Arches. Trans. of the
Royal Irish Academy, vol. XXIX, pt. 3, pp. 43-98.
- CHANDLER, F. W. A Technical Description of the Engineering
Building of the Mass. Institute of Technology. Boston,
1890. 26b
- DE GONDA, BELA M. La regularisation des Portes de fer et des
autres Cataractes du bas Danube. Paris, 1892.
- HALE, IRVING. The Latest Method of Electric Car Control.
Colorado Scientific Society, in Denver, April 3, 1893.
- MELNIKOFF, N. P. Note sur l'Ancien Canal de Perecop en
Crimee. (in Russian).

GEOGRAPHY.

SERIALS.

ANTWERP [Belgium] Societe royale de Geographie d'Anvers.	
Bulletin, Vol. XVI fasc. 4. +	13
Le Colorado par M. A. de Ceuleneer.	13
BERLIN [Germany] Gesellschaft fur Erdkunde zu Berlin.	
Zeitschrift. Vol. XXVII, pts 1-4. +	5d
Verhandlungen. Vol. XIX, pts. 1-10. +	5d
BUDAPEST [Hungary] Hungarian Geographical Society.	
(Foldrajzi Kozlemenyek). Vol. XX, Nos. 1-8	
(1892). +	13a
CHRISTIANIA [Norway] Norwegische Commission der Eu-	
ropaischen Gradmessung.	
Geodatische Arbeiten. Hefts I-VII. +	20e
—Norske Gradmaalingskommission.	
Vandstandsobservationer. Hefts I, III, IV. +	20e
DONAI [France] Union Geographique du Nord de la	
France.	
Bulletin. Vol XIII, Trimestre 1. 1892. +	13
GENEVA [Switzerland] Societe de Geographie de Geneve	
Le Globe. (Bulletin de la Societe.) Vol.	
XXXI, No. 1 (1882). +	13
GREIFSWALD [Germany] Geographische Gesellschaft zu	
Greifswald.	
Jahresbericht II, 1, 2; III, 1, 2; IV. +	13
LEIPA [Germany] Nordbohmischer Excursions-Club.	
Mittheilungen. Jahrgange XII-XV (1889-92). +	13b
MANCHESTER [England] Manchester Geographical Society.	
Journal. Vols. I, II (and suppl.) III; IV, g-l;	
V, a-f; VI, j-l. +	13a
MEXICO [Mexico] Sociedad de Geografia y Estadistica.	
Boletin. Vols. IV-V. +	13a

- MILAN [Italy] Societa d'Esplorazione Commerciale in
Africa.
Anno VII, fasc. 5, 7, 8, 9, 10. + 13a
- ODESSA [Russia] Club Alpin de Crimée.
Livraison II. 1892. + 13
- PARIS [France] Nouvelles Geographiques (publiees sous
la direction de F. Schrader.)
Annee II, No. 1. 1892. + 13
- QUEBEC [Canada] Geographical Society of Quebec.
Transactions. Vol. II, No. 1. + 13
- RIO DE JANEIRO [Brazil] Instituto Historico e Geographico
Braziliero.
Revista Trimensal. Vol. L, Fols. 1-2; LIV, 1. + 1d
- ROUEN [France] Societe Normande de Geographie.
Bulletin. Annee XIV, Jan. to Aug. + 13a
- TOKIO [Japan] Tokio Geographical Society.
Journal. 1891. + 13c
- WASHINGTON [D. C.] The National Geographic Magazine.
Vols. I-III. + 13a
- Smithsonian Institution.
Powell's Exploration of Colorado River. 1869-72. 18
- War Department.
Report of Expedition to Cape Barrow, Alaska
(1885). 18
Report of Third International Geographical Con-
gress, Venice, 1885. 17d
Exploration of Nevada and Arizona (1871). 17d

NON-SERIALS.

Pamphlets, 13d.

- ACKERMANN K. Bestimmung der erdmagnetischen Inklination von Kassel.
- BALLOD, CARL. Der Staat Santa Catharina in Sudbrasilien. Inaug. Diss. Jena.
- CLARKE, W. B. The Surface Configuration of Maryland. Maryland State Weather Service, vol II, No. 11.
- COLVIN, V. Report of Topographical Survey of Adirondack Wilderness of New York. Albany, 1873. 15b.
- COMSTOCK, T. B. Notes on the Region North of the Vermillion Lake District, in British America. Trans. Amer. Inst. of Mining Engineers, 1887.
- DAVIS, W. M. Geographical Illustrations. Proceedings of the American Institute of Instruction, 1892.
- DEUTSCHER NATURFORSCHER UND AERZTE. Danzig in naturwissenschaftlicher u. medizinischer Beziehung. Danzig, 1880. 13d.
- FELIX, J. and LINK H. Uber die Tektonischen Verhaltnisse der Republik Mexico.
- GILBERT, G. K. A new Method of Measuring Heights by means of the Barometer. 2nd Annual Report of Director of the U. S. Geol. Survey, 1880-1881. pp. 405-566.
- GUZMAN, DAVID I. "Apuntamientos sobre la Topografik Fisica de la Republica del Salvador." 13a.
- HAUGHTON, S. On the Tides of the Arctic Seas. Philosophical Transactions of the Royal Soc., vol. CLXV, pt. 2, pp. 317-360.
- HAYDEN, F. V. Preliminary Report of the Field Work of the U. S. Geol. & Geog. Survey of the Territories for the Season 1877. Washington, 1877. 16d.

- HAYES, C. W. An Expedition through the Yukon District. National Geographic Magazine, vol. IV, pp. 117-162, pls. 18-20.
- IRELAN, WM. The Channel Islands. 9th Annual Report of the State Mineralogist of California.
- KIAER, F. C.—Professor Christen Smith's Dag bog paa Reisen til de Canariske Oer i 1815. Christiania, 1889.
- KREIDEL, W. Untersuchungen uber den Verlauf der Flutwellen in den Ozeanen. Inaug. Diss. Kiel, 1889.
- LIBBEY, WM. Topographic, Hypsometric and Meteorological Report of Princeton Scientific Exhibiton of 1877. Bulletin No. 1. New York, 1879. 15b.
- NORRIS, P. W. Report of the Yellowstone National Park for the year 1878. Washington, 1878. 16d.
- PITTIER, H. Observaciones Efectuadas en el Ano de 1889. Anales del Instituto Fisico-Geografico Nacional. Vol. II, 1889.
- POWELL, J. W. Report of the Methods of Surveying the Public Domain. Washington, D. C., 1878. 16d.
Exploration of the Colorado River 1869-72.
- SCHNEIDER, OSCAR. Die Kaukasuslander. Dresden. 12d.
- SKEEL, T. The Isthmus of Tehuantepec, Mexico.
- WINSLOW, A. The Mapping of Missouri. Trans. of Acad. of Sci. of St. Louis, vol. VI, No. 3, pp. 56-99.

Geology—Serials.

GEOLOGY.

SERIALS.

- AUGUSTA [Maine] Geology of State of Maine.
Report, 1838, 1839. 15d
- Report of Secretary of Maine Board of Agriculture (annual) 1861, 1862. (Contains Reports on Geology.) 15d
- AUSTIN [Texas] Geological Survey of Texas.
Annual Reports I-III. + 15d
Bulletin 1. + 15d
- BERKELEY [Cal.] University of California.
Bulletin of the Department of Geology (Dr. A. C. Lawson, Ed.) Vol. I, Nos. 1-2. + 14a
- BERLIN [Germany] Deutsche Geologische Gesellschaft.
Zeitschrift, Vols. XXIV-XLIV. 14c-d
- BERLIN [Germany] Zeitschrift f. praktische Geologie
(Edited by Max Krabmann, Wetzlar, Rheinprovinz). 1893, Hfts. 1-8. + 13d
- BOLOGNA [Italy] Congres Geologique International.
Comptes Rendus. 2me Session, Bologne, 1881. 14a
- BRUSSELS AND LIEGE [Belgium] Melanges Geologiques par
G. Dewalque. Series 5-6. + 13d
- BUDAPEST [Hungary] Hungarian Geological Society.
(Foldtani Kozlony.)
Journal, Vol XXII, parts 11-12. + 14a
- COLUMBUS [Ohio] Geological Survey of Ohio.
First Annual Report, 1838. 15a
Geology, Vols. I-II.
Paleontology, Vols. I-II.
Maps, 1873. 15a
Report (Orton) 1890 (with maps). 15a

GLASGOW [Scotland] Geological Society of Glasgow.

Transactions, Vols. VI-VIII, IX pt. 1. +

14b

HARRISBURG [Penn.] Geological Survey of Pennsylvania. +

17a-b-c-d

- AA. Atlas—Southern Coal Field, parts 1-4.
- AA. Atlas—Southern Coal Field, part 4B.
- AA. Southern Coal Field, parts 5-6.
- AA. Atlas—Western Middle Coal Field, parts 1-3.
- AA. Atlas—Northern Coal Field, parts 1-6.
- AA. Atlas—Eastern Middle Coal Field, parts 1-3.
- AA. Anthracite Statistics, 1883-1884.
- C. York and Adams Counties, 1876.
- C². York and Adams counties, 1877.
- C³. Lancaster County, with Atlas, 1880.
- C⁴. Chester County, 1883.
- C⁵. Delaware County, 1885.
- C⁶. Philadelphia and parts of Montgomery and Bucks Counties, 1882.
- C⁷. Atlas—Bucks and Montgomery Counties.
- D. Lehigh County Iron Mines, 1875.
- D². Lehigh County Iron Mines, 1878.
- D³. Vol I, Lehigh and Northampton Counties, 1883.
- D⁴. Vol. II, Part 1, Berks County, 1883.
- D⁵. Atlas—Lehigh and Northampton Counties.
- D⁶. Atlas—Cumberland, Franklin and Adams Counties.
- D⁷. Atlas—South Mtn. Sheets.
- E. Trap Dykes and Azoic Rocks of S. E. Pennsylvania, 1878.
- F. Mifflin, Snyder and Huntingdon Counties, 1878.
- F². Perry County, 1884.
- F³. Union, Snyder, Mifflin and Juniata Counties.
- G. Bradford and Tioga Counties, 1878.
- G². Lycoming and Sullivan Counties, 1880.

HARRISBURG [Penn.] Geol. Survey of Pennsylvania—continued.

- G². Potter County, 1880.
- G⁴. Clinton County, 1880.
- G⁵. Susquehanna and Wayne Counties, 1881.
- G⁶. Pike and Monroe Counties, 1882.
- G⁷. Wyoming, Lackawanna, Lucerne, Columbia,
Montour and Northumberland Counties,
1883.
- H². Cambria County, 1877.
- H³. Somerset County, 1877.
Atlas to Reports H² and H³.
- H⁴. Indiana County, 1878.
- H⁵. Armstrong County, 1880.
- H⁶. Jefferson County, 1881.
- H⁷. Clearfield County, 1884.
- I². Oil Well Records in Venango, Warren,
Crawford, Clarion, Armstrong, Butler,
etc., 1877.
- I³. Venango, Warren, Clarion and Butler Oil
Regions, with Atlas, 1880.
- I⁴. Warren County, 1883.
- I⁵. Oil and Gas, 1887–1888.
- K. Greene and Washington Counties, 1876.
- K². Fayette, Westmoreland, and S. E. Alle-
gheny Counties, 1877.
- K³. Fayette and Westmoreland Counties, 1878.
- K⁴. Monongahela River Coal Mines, Pt. 1, 1884.
- L. Coke Manufacture and the Use of Natural
Gas in Iron Making, 1876.
- M. Chemical Analyses in 1874–5, 1875.
- M². Chemical Analyses in 1876–8, 1879.
- M³. Chemical Analyses in 1879–80, 1881.
- N. Tables of Elevations in Pennsylvania, 1878.
- O. Catalogue of Specimens in Geological Mu-
seum, 1878.
- O². Catalogue of Specimens in Geological Mu-
seum, 1880.
- O³. Catalogue of Specimens, continued.

HARRISBURG [Penn.] Geol. Survey of Pennsylvania—continued.

- P. Vols. I and II, Coal Flora of Pennsylvania and United States, 1880.
- P. Vol. III, Coal Flora of Pennsylvania and United States, 1884.
- P. Atlas of Coal Flora of Pennsylvania and United States, 1879.
- P². Permian Flora of West Virginia and S. W. Pennsylvania, 1880.
- P³. Description of the Fossils *Ceratiocaridæ* and *Eurypteridæ*, 1884.
- P⁴. Appendix.
- Q. Beaver, N. W. Allegheny, and S. Butler Counties, 1878.
- Q². Lawrence County, 1879.
- Q³. Mercer County, 1880.
- Q⁴. Crawford and Erie Counties, 1881.
- R. McKean County, with Atlas, 1880.
- R². Cameron, Elk and Forest Counties, part 2, with Atlas, 1885.
- T. Blair County, with Atlas, 1881.
- T². Bedford and Fulton Counties, 1882.
- T³. Huntingdon County, 1885.
- T⁴. Centre County, 1884.
- V. North Butler County, 1879.
- V². Clarion County, 1880.
- X. Geological Atlas of Counties, 1885.
- Z. Terminal Moraine in Pennsylvania and Western New York.
- Annual Report, 1886, parts 1-4, 1887.
- Summary Final Report, Vol. II, Upper Silurian and Devonian.

HARRISBURG [Penn.] 2d Geological Survey of Penn.

Grand Atlas.

- Division I, County Geol. Maps, pt. i; II, Anthracite Coal Fields, i-ii; III, Petroleum and Bituminous Coal Fields, i; IV, South Mountain and Great Valley Topographical Maps, i; V., Central and South Eastern Pennsylvania, i. +

- HELSINGFORS** [Finland] Commission Geologique de la Finlande.
 Carte Geologique de la Finlande. Livraisons 22-24. +
- INDIANAPOLIS** [Ind.] State Geol. Survey.
 Maps, (1869.) 16a
 Reports. 16a
 Maps of First, Second, Third, Fourth and Fifth Reports. Second Report, 1870, Vol. II. 16th. Annual Report, (1888) 16a
- State Geol. Dept.
 Natural Gas Map of Ind. 16a
- JEFFERSON CITY** [Mo.] Geological Survey of Missouri.
 Report on Coal, (1891), on Iron Ores, (1892.) + 16a
 Biennial Report, 1891. + 16a
 Bulletin, 1887, Nos. 2-4; 1889, 1, 5; 1890-91. Nos. 2-5 + 16a
 The Higginsville Sheet in Lafayette County. + Atlas case.
- LEEDS** [England] Leeds Geol. Association.
 Transactions, 1886-1891. + 15b
- LIEGE** [Belgium] Societe Geologique de Belgique.
 Annales, Vols I-III, VIII, X-XIII, XIV, 2; XV, 2, 3; XVI, 1. + 15a
- LILLE** [France] Societe Geologique du Nord.
 Memoires, Vols I-III. + 13d
- LISBON** [Portugal] Commissao dos Trabalhos Geologicos de Portugal.
 Comunicacoes, Vol. I. + 14
- LITTLE ROCK** [Arkansas] Geological Survey of Arkansas.
 Annual Report, 1888, Vols. I-IV; 1889, II; 1890, I-III; 1891, I; 1892, I. + 16c
- LIVERPOOL** [England] Geological Association.
 Transactions (Journal) Vol. II, IV-VI, IX-XII. 14a

- LONDON [England] Geological Society of London.
 Abstracts of Proceedings, Nos. 476-594. Sessions, 1885-1892. + 14d
 — Annals of British Geology by J. F. Blake, 1890. + 14a
- MADISON [Wis.] Wisconsin Geological Survey.
 Annual Report, 1876-77. 16a
 Geol. of Wis. Vols. I-IV, (two copies of each). 16a
 Atlases to Accompany Vols. I-IV of Geology of Wisconsin. Atlas case
- MANCHESTER [England] Manchester Geological Society.
 Transactions, Vol. XXI, Nos. 1-18; XXII, 1-2. + 14b
- MINNEAPOLIS [Minn.] Minnesota Geological Survey.
 Bulletin, Nos. 1-7. + 16c
 Annual Report, 1-20. 16c
 — Geol. and Nat. Hist. Survey.
 Geol. and Nat. Hist. of Minn., 1872-85, Vols. I, II. + 16b
- MELBOURNE [Victoria] Geological Society of Australasia.
 Transactions, Vol I, pt. 6. + 14d
- MONTGOMERY [Alabama] Geol. Survey of Alabama.
 Bulletin, Nos. 2-3. + 15c
- PARIS [France] Annuaire Geologique Universel.
 Vols. I-VII. + 15d
 — Catalogue des Fossiles du Systeme Silurien du Centre de la Boheme, de la Collection de J. M. Scharj de Prague, envoyes a l'Exposition Universelle de Paris de 1867. 15b
- PRAGUE [Austria] System Silurien du Centre de la Boheme par J. Barrande. 14a
 Cephalopodes, Vol. II. 14a
 Brachiopodes, Vol. V. 14a
 Acephales, Vol. VI. 14a
 Defense des Colonies. 14a

- RIO DE JANEIRO [Brazil] Instituto Historico, Geographico, e Ethnographico Brasileiro.
 Catalogo das Cartas Geographicas, Hidrographicas, Atlas, Planos e Vistas existentes na Bibliotheca. + **15b**
- ROME [Italy] R. Comitato Geologico d'Italia.
 Bollettino, Vols. I-XXIII, 1-2. + **15c**
- ST. JOHN'S [Newfoundland] Geological Survey of Newfoundland.
 Report of Progress for year 1873. **15d**
- ST. PETERSBURG [Russia] Comite Geologique de la Russie.
 Memoires, Vols. I, Nos. 1-4; II, 1-5; III, 1-4;
 IV, 1-2; V, 1-5; VI, VII, 1-2; VIII, 1-2;
 IX, X, XI, 1-2; XIII, 1. + **15e**
 Bulletins, Vols. I-III, IV, Nos. 1-10; V, 1-11;
 VI-XI. Suppl. with Vols. VIII-X. + **14a**
 Bibliotheque Geologique, 3-6. + **15e**
- Russisch-Kaiserliche Mineralogische Gesellschaft.
 Verhandlungen, 2d Series, Vols X-XXIX. + **14b**
 Register. **14b**
- Kaiserliche Mineralogische Gesellschaft.
 Materialien zur Geologie Russlands, Vol. XVI,
 (1893). + **13d**
- SPRINGFIELD [Illinois] Geological Survey of Illinois.
 Vols. I, VII, VIII. + **15d**
- STRASBURG [Germany] Commission fur die Geologische Landesuntersuchung von Elsass-Lothringen.
 Vols. I, III, IV, Heft 1. **13d**
- SYDNEY [N. S. Wales] Department of Mines.
 Records of Geol. Survey of N. S. Wales, Vols. I,
 II, pts. 1-2; III, 1. + **15e**
 Memoirs of Geol. Survey of N. S. W. 1875, 1887,
 1888, 1890. + **15e**
 Annual Report, 1888, 1889, 1890. **15e**

- TRENTON** [N. J.] Geological Survey of New Jersey.
Vols. I, II, pts 1 and 2, 1888-90. + **15a**
- VIENNA** [Austria] K. K. Geologische Reichsanstalt.
Jahrbuch, Vols. XXXVI-XLII. + **13e**
Verhandlungen, 1886-1892. + **13e**
- WASHINGTON** [D. C.] U. S. Geological Survey of the Territories (Hayden).
Bulletin, Vols. II, Nos. 1-4; III, 1, 2, 4; IV, 1-4; V, 1-4; VI, 1-4. **16c**
Bulletin, Second Series, Nos. 1, 2, 6. **16c**
Miscellaneous Publications, Nos. 1, 3, 4, 7-12. **16c**
Reports 1869-1873, 1875, 1877, 1878. **16d**
Monographs, Vols. I-III, V-XII. **16d-e**
Catalogue of Publications. **16d**
- U. S. Geographical Surveys west of the 100th Meridian (Wheeler), Vols. I-VII. **17e**
- U. S. Exploration of the Fortieth Parallel (King).
Vols. I, II, IV-VII. **16d**
- U. S. Geographical and Geological Survey of the Rocky Mountain Region (Powell).
Report of J. W. Powell on the Geographical and Geological Survey of the Rocky Mountain Region, 1877, 1878. **16d**
Topographical and Geological Atlas of the Black Hills of Dakota to Accompany Report of Henry Newton. Atlas case
Atlas Accompanying Report on the Geology of a portion of the Uinta Mountains, by J. W. Powell. Atlas case
- U. S. Geological Survey.
Bulletin, Nos. 1-86, 90-96. + **18c**
Annual Report, 1880-89, Vols. I-XI. + **18e**
Report—Mineral Resources, 1882-1891. + **18b**
U. S. Relief Map. Atlas case
Monographs, Vols. I-XVIII, -XX. + **18d**

- WASHINGTON [D. C.] U. S. Geological Survey—continued.
 Atlas to accompany a Monograph on the Geology
 and Mining Industry of Leadville, Col., by
 S. F. Emmons. Atlas case.
 Atlas to accompany a Monograph on the Geology
 of the Quicksilver Deposits of the Pacific
 Slope, by Geo. F. Becker. Atlas case.
 Atlas to Accompany a Monograph on the Tertiary
 History of the Grand Canon District. Atlas case.
 Atlas to Accompany a Monograph on the Geol-
 ogy of the Eureka District, Nev., by Arnold
 Hague. Atlas case.

NON-SERIALS.

Pamphlets, 14e.

- ACKERMANN, K. Repertorium der Landeskundlichen Litteratur
 fur den preussischen Regierungsbezirk Kassel, mit Nach-
 trage 1-3.
- BACKSTROM, H. Beitrage zur Kenntniss des islandischen Lipa-
 rite. Geol. Foren. i. Stockholm Forhandl., vol. XIII.
 pp. 637-682.
- Ueber Fremde Gesteinseinschlusse in einigen skandinavi-
 schen Diabasen.
- Ueber Angeschwemmte Bimstein und Schlacken der Nord-
 europaischen Kusten.
- Om "Kvartskakelagren" vid Guda, Norge. Geol. Foren i.
 Stockholm Forhandl. Bd. XII, pp. 209-246, Stockholm,
 1890.
- BALTZER, A. Glacialgeologisches v. der Sudseite der Alpen.
 Naturf. Gesell. in Bern, 1892.
- BARROIS, CHARLES. Faune du Calcaire d'Erbray (Loire Infe-
 riore) Contribution a l'etude du terrain Devonien de l'ouest
 de la France. Lille 1889. 14a.
- Memoire sur la distribution des Graptolites en France.

- BEECHER, C. E. The Development of a Paleozoic Poriferous Coral. (Plates IX-XIII) Symmetrical Cell Development in the Favositidæ. (Plates XIV, XV) Trans. Conn. Acad., vol. VIII, 1891, pp. 207-220.
- BLYTT, A. The probable Cause of the Displacement of Beach-lines, Christiania, 1889.
- BRANNER, J. C. The Relations of the state and national Geological Surveys to each other and to the Geologists of the Country. Address at Salem, 1890. Proc. A. A. A. S., vol. XXXIX, pp. 1-21.
- BRIGHAM, A. A chapter in Glacial History; with illustrative Notes from central New York. Transactions of the Oneida Historical Society, 1889-1892.
- Rivers and the Evolution of Geographic Forms. Bulletin of the Amer. Geog. Society, March, 1892, pp. 1-21.
- The Geology of Oneida County. Transactions of the Oneida Historical Society, 1887-1888, pp. 1-17.
- BROGGER, W. C. Die Silurischen Etagen 2 u. 3 im Kristiania-gebiet und auf Eker. Christiania, 1882. 14a
- BRUSNA, S. Fossile Binnen-Mollusken aus Dalmatien, Kroatien, u. Slavonien. 1874.
- CROSS, WHITMAN. Post-Laramie Deposits of Colorado. Amer. Journ. Sci. vol XLIV, July, 1892.
- Constitution and Origin of Spherulites in Acid Eruptive Rocks. Bulletin Philosophical Society of Washington, vol. XI, pp. 411-444. Pls. 5, 6.
- The Post-Laramie Beds of Middle Park, Colo. Proceedings of the Colorado Scientific Society, in Denver, Oct. 3, 1892.
- DEICHMULLER, J. v. Die Meteoriten des Koniglichen Mineralogischen Museums in Dresden. Abh. der Gesellschaft "Isis" in Dresden, 1886. Abh. II, pp. 40-48, 92-94.

- ELDRIDGE, G. H. The Florence Oil Field, Colorado. 1891.
Read before Amer. Inst. of Mining Engineers, Oct., 1891.
- On Certain Peculiar Structural Features in the Foot-Hill Region of the Rocky Mountains, near Denver, Col. Bulletin Phil. Soc. Washington, vol. XI, 1890. pp. 248-274.
- A Preliminary Sketch of the Phosphates of Florida. Read before Amer. Inst. of Mining Engineers, 1892.
- FEGRAENS, T. Om de Losa Jordaflagringarna i nagra af Norslands Elfdalar. Stockholm, 1890.
- FELIX, J. Untersuchung uber fossile Holzer, Zeitsch. d. Deutsch. geolog. Gesellschaft, vol. XXXIX, pp. 517-528, mit Tafel XXV.
- Beitrage zur Kenntniss der Gattung Protosphyraena Leida. Zeitschrift der deutschen geolog. Gesellschaft, vol. XLII, pp. 278-302, mit Tafeln XII-XIV.
- Die fossilen Holzer Westindiens. Sammlung paleontologische Abhandlungen, Series I, Heft 1, 1883.
- FELIX, J. and LENK, H. Beitrage zur Geologie u. Paleontologie der Republik Mexico. Stuttgart (E. Koch), 1891.
- FOSHAY, P. MAX and HICE, R. R. Glacial Grooves at the Southern Margin of the Drift. Bull. Geol. Soc. of Amer., vol. II, pp. 457-464, pl. 18.
- Newly Discovered Glacial Phenomena in the Beaver Valley. Amer. Naturalist, 1890, pp. 816-818.
- FRAZER, P. Archæan-Palæozoic Contact near Philadelphia, Penn. Proc. Amer. Assoc. for Advancement of Science. vol. XXXIII, 1884, pp. 1-5.
- Petrefactenfunde im Rothliegenden. Neues Jahrbuch fur Mineralogie, 1889. Bd. II, pp. 193-4.
- Ueber die rothen und bunten Mergel der oberen Dyas bei Manchester. Abh. der Gesellschaft "Isis" in Dresden, 1889, Abh. III, pp. 1-10, 14-21.
ii-8Ap.

- GEINITZ, H. B. Nachtragliche Mittheilungen uber die rothen und bunten Mergel der oberen Dyas bei Manchester. *Ibid.* 1890, Abh. V, pp. 1-6.
- GEINITZ, H. B. and MARCK, W. v.D. Geologie von Sumatra. Mittheilungen aus den Koniglichen Mineralogischen Museum in Dresden, Heft 2, pp. 1-16.
- GEOLOGY SOCIETY OF LONDON. List of Members, 1884, 1891. 14a.
- GILBERT, G. K. The Moon's Face. *Bulletin Philosophical Society of Washington*, vol XII, pp. 241-292, pl. 3.
- The Colorado Plateau Region considered as a Field for Geological Study, *Amer. Journ. of Sci.*, 1875, July and August, pp. 1-27.
- The Strength of the Earth's Crust. *Bull. Geol. Soc. Am.*, vol. I, 1888, pp. 23-27.
- The History of the Niagara River. From 6th Annual Report of the Commissioners of the State Reservation at Niagara for 1889.
- The Sufficiency of Terrestrial Rotation for the Deflection of Streams. *National Academy of Sciences*, vol. III, pp. 1-6.
- GRANT, U. S. The Stratigraphic Position of the Ogishke Conglomerate of Northeastern Minnesota, *Amer. Geologist*, vol. X, July, 1892, pp. 1-10.
- Report of Geological Observations made in Northwestern Minnesota during the summer of 1888. Part IV of the Seventeenth Annual Report of Minn. Geol. Survey, St. Paul, Minn., 1889.
- Account of a Deserted Gorge of the Mississippi near Minnehaha Falls. *Amer. Geologist*, July, 1890, pp. 1-6.
- Note on Quartz-Bearing Gabbro in Maryland. *Johns Hopkins University Circulars*, No. 103.

- HARKER, A. Rocks from the Cross Fell Inlier. *Quart. Journ. Geol. Soc.*, vol. XLVII, pp. 512-525.
- On Local Thickening of Dykes and Beds by Folding. *Geol. Magazine*, 1889. Decade III, vol. VI., No. 2, pp. 69-70.
- On the Slaty Cleavage and Allied Rock Structures with Special Reference to the Mechanical Theories of their Origin.
- Rocks from the Tonga Islands. *Geol. Magazine*, 1891. Decade III, vol. VIII, No. 324, p. 250.
- The Shap Granite and Associated Rocks. *Quart. Journ. Geol. Soc.*, Aug., 1891, vol. XLVII, pp. 266-328, pls. 10, 11.
- Geology of Mynydd Mawr. *Geol. Magazine*, 1888 (May). Decade III, vol. V, No. 5, p. 221.
- Additional Note on the Blue Hornblende of Mynydd Mawr. *Ibid*, No. 10, pp. 455-456.
- Contortion and Metamorphism. *Ibid*, 1890, vol. VII, No. 310, p. 189.
- Woodwardian Museum Notes on "Eyes" of Pyrites and other Minerals in Slate. *Ibid*, 1889, vol. VI, No. 303, p. 396.
- Woodwardian Museum Notes. On Various Crystalline Rocks. *Ibid*, 1891, vol. VIII, No. 322, p. 169.
- On Some Anglesey Dykes, Part I. *Ibid*, No. 9, pp. 410-416; Part II. *Ibid*, No. 12, pp. 546-552; Part III. *Ibid*, No. 6, pp. 267-272.
- Physics of Metamorphism. *Ibid*, January, 1889, vol. VI, No. 1, p. 15.
- The Cause of Slaty Cleavage: Compression v. Shearing. *Ibid*, 1885, vol. II, No. 1, p. 15.
- Stages of Slaty Cleavage. *Ibid*, vol. II, No. 6, p. 266.

- HARKER, A.—continued. Petrological Notes on Some of the Larger Boulders on the Beach South of Flamborough Head.
- The Eruptive Rocks in the Neighborhood of Sarn, Caernarvonshire. *Quart. Journ. Geol. Soc.*, 1888 (Aug.), pp. 442-462.
- The Ancient Lavas of the English Lake District.
- Notes on North of England Rocks. I, II and III.
- The Oolites of the Cave District. *Naturalist*, 1885 (May), pp. 229-232.
- HAYDEN, F. V. Preliminary Report of the Field Work of the U. S. Geol. and Geog. Survey of the Territories for the season of 1878. Washington, D. C., 1878. 16d.
- Catalogue of Publications of the U. S. Geological Survey of the Territories. Washington, 1874. 16d.
- HAYES, C. W. The Overthrust Faults of the Southern Appalachians. *Bull. Geol. Soc. America*, 1891. vol. II, pp. 141-154.
- HEADEN, W. P. The Production of Columbus and Tungstous Oxides in Forming Compounds of Iron and Tin.
- HEINEMANN, J. Die Krystallinischen Geschiebe Schleswig-Holsteins. Inaug. Diss. Kiel, 1879.
- HIBSCH, J. E. Die Insel aeltern Gebirges und ihre Nachste-Umgebung im Elbthale nordlich v. Tetschen. *Jahrbuch der K. K. Geol. Reichsanstalt*, vol. XLI, pp. 235-288.
- Geologie fur Land- u. Forstwirte.
- Der Doleritstock u. das Vorkommen v. Blei- u. Silbererzen bei Rongstock im bohmischen Mittelgebirge.
- Gangformiges Auftreten v. doleritischem Nephelinit in der Umgebung des Schreckensteins im bohmischen Mittelgebirge.

- HOBBS, Wm. H. Secondary Banding in Gneiss. Bull. Geol. Soc. Am., vol. III, pp. 460-464; plate 14.
- Notes on a Trip to the Lipari Islands. Trans, Wis. Acad. Sci., vol. IX, pp. 21-32; plate 1.
- Phases in the Metamorphism of the Schists of Southern Berkshire. Bull. Geol. Soc. Am., vol. IV, pp. 167-178.
- HOLMES, W. H. Maps and Panoramas. Twelfth Annual Report of U. S. Geol. and Geog. Survey of the Territories. Washington, D. C., 1878. 16d.
- HOVEY, E. O. Observations of Some of the Trap Ridges of the East Haven-Branford (Ct.) Region. Amer. Journ. Sci (1889). vol. XXXVIII, pp. 363-383.
- HUBBARD, L. L. Beitrage zur Kenntniss der Nosean-fuhrenden Auswurfinge des Laacher Sees. Inaug. Diss. Wien., 1887.
- HYATT, A. On Reversions among the Ammonites. Proc. Boston Soc. Nat. Hist. vol. XIII, pp. 22-43.
- The Jurassic and Cretaceous Ammonites. Ibid, vol. XVI, pp. 365-372.
- Biological Relations of the Jurassic Ammonites. Ibid, vol. XVII, pp. 236-241.
- Remarks on the Porphyries of Marblehead. Ibid, vol. XVIII, pp. 220-224.
- Evolution of the Faunas of the Lower Lias. Ibid, vol. XXVI, pp. 17-30.
- Carboniferous Cephalopods. Geol. Survey of Texas, 1890. pp. 329-354.
- Jura and Trias at Taylorville, Cal. Bull. Geol. Soc. Am., 1892, vol. III, pp. 385-412.
- IRVING, R. D. AND VAN HISE, C. R. The Penokee Iron-Bearing Series of Michigan and Wisconsin. Tenth Annu. Report of the Director U. S. G. S., 1888-89. Washington, 1890, pp. 343-508., pls. 22-42.

- IRVING, R. D. Origin of the Ferruginous Schists and Iron Ores of the Lake Superior Region. *Amer. Journ. Sci.* 1886, vol. XXXII, pp. 255-272.
- JACK, R. L. Geological Observations in British New Guinea in 1891.
- The Russell River Gold Field.
- The Normanby Gold Field.
- JAMES, J. F. Section of the Maquoketa Shales in Iowa. *Proc. A. A. A. S.*, vol. XXXVIII.
- Manual of the Paleontology of the Cincinnati Group Part I, *Jour. Cincinnati Soc. Nat. Hist.*, vol. XIV, pp. 45-72. Part II, *Ibid.*, vol. XIV, pp. 149-163.
- On the Age of the Pt. Pleasant, Ohio, Beds. *Ibid.*, vol. XIV, pp. 93-104, pls. III and IV.
- Ancient Channel of the Ohio River at Cincinnati. *Ibid.*, vol. XI, pp. 96-101.
- Studies in Problematic Organisms—Genus *Scolithus*. *Bull. Geol. Soc. Cin.*, vol. III, 1891, pp. 32-44.
- "Illustrations of the Fauna of the St. John Group," by G. F. Mathew. (Criticism.)
- JAMES, U. P. Catalogue of Lower Silurian Fossils of the Cincinnati Group. New Edition.
- Description of ten New Species of *Monticulipora* from the Cincinnati Group, Ohio. *Paleontologist*, Sept. 1882, pp. 45-56.
- JAMES, U. P. AND J. F. Monograph of the Monticuliporoid Corals of the Cincinnati Group. *Jour. of Cin. Soc. of Nat. Hist.*, vol. X, pp. 118-141, 158-184, pl. 2; vol. XI, pp. 14-47, pl. 1.
- KATZER, F. *Geologie von Bohmen*. Prag, 1892. 15a.
- Das altere Palæozoicum in Mittelbohmen, Die Nothwendigkeit einer Neueintheilung Desselben. Mit. 1 Karte u. 1 autogr. Tafel-Profile. Prag. 1888.

- KEYES, C. R. Certain forms of *Straparollus* from Southern Iowa. *Amer. Geologist*, 1890, pp. 193-197.
- Soleniscus, its Generic Characters and Relations. *Amer. Naturalist*, 1889, pp. 420-424.
- The Bed Rock Sandstone of Marion County, Iowa. *Amer. Jour. Science*, vol. XLI, pp. 273-276.
- Remarks on the Perisomic Plates of the Crinoids.
- An Annotated Catalogue of the Mollusca of Iowa. *Bull. of the Essex Institute*, vol. XX.
- The Sedentary Habits of *Platyceras*. *Amer. Jour. Sci.*, vol. XXXVI, pp. 269-272.
- Genesis of the *Actinocrinidæ*. *Amer. Naturalist*, 1890, pp. 243-254, pl. 7.
- Review of the Progress of American Invertebrate Paleontology for the Year 1889. *Ibid.*, 1890, pp. 131-138.
- Review of the Progress of American Invertebrate Paleontology for the year 1890. *Ibid.*, 1891, pp. 327-333.
- The Coal Measures of Central Iowa, and Particularly in the Vicinity of Des Moines. *Amer. Geologist*, 1888, pp. 396-404.
- Surface Geology of Burlington, Iowa. *Amer. Naturalist*, vol. XXII, No. 264, pp. 1049-1054, plates 23, 24.
- Discovery of Fossils in the Limestones of Frederick County, Maryland. *Johns Hopkins University Circulars*, No. 83.
- Lower Carboniferous Gasteropoda from Burlington, Iowa. The American Species of *Polyphemopsis*, *Sphaerodoma*; a Genus of Fossil Gasteropods, *Proc. Acad. Nat. Sci. Philadelphia*, 1889, pp. 284-309.
- A Geological Section across the Piedmont Plateau in Maryland. (A supplement to a paper by G. H. Williams entitled, "The Structure and Petrography of the Piedmont Plateau in Maryland. *Bull. Geol. Soc. Am.*, vol. II, pp. 301-322., pl. 12.

- Stratigraphy of the Carboniferous in Central Iowa. Bull. Geol. Soc. Am. vol. II, pp. 277-292, pls. 9-10.
- The Naticoid Genus *Strophostylus*. Amer. Naturalist, 1890, pp. 1112-1147, pl. XXXII.
- Fossil Fannas in Central Iowa. Proc. Acad. Nat. Sci. Philadelphia, 1891, pp. 242-265.
- Proposed Economical Geological Survey of Iowa. Iowa State Register, 1891.
- KJERULF, T. Om Stratifikationens Spor. Christiania, 1877.
- Om Skuringsmaerker, Glacialformationen, Terrasser og Strandlinier samt om grundfjeldets og sparagmitfjeldets maegtighed i Norge. Christiania, 1873.
- KNOP, A. Beitrag zur Kenntniss der in den Diamantfeldern von Jagers-fontein (Sudafrika) vorkommenden Mineralien u. Gesteine. Separatabdruck aus dem Bericht uber die XXIIten Versammlung des Oberrheinischen Geologischen Verein.
- KOLESCH, K. Ueber *Eocidaris Keyserlingi* Gein. Inaug. Diss. Jena, 1887.
- KULP, G. B. Coal, its Antiquity, Discovery and Early Development in the Wyoming Valley. Wyom. Hist. & Geol. Soc., 1890.
- KUNZ, G. F. On five new American Meteorites. Amer. Jour. Sci., 1890, vol. XL, pp. 312-323.
- LACOE, R. D. List of Palæozoic Fossil Insects of the U. S. and Canada. Wyoming Hist. and Geol. Soc., Apr., 1883.
- LEBOUR, G. A. Catalogue of Hutton Collection of Fossil Plants. London, 1878. 15b.
- Illustrations of Fossil Plants. London, 1878. 15b.
- LIEBETRAU, E. Beitrage zur Kenntniss des Unteren Muschelkalks bei Jena. Inaug. Diss. Jena, 1890.

- LINDAHL, J. Description of a skull of *Megalonyx Leidyi*, n. sp.
Read before the Am. Philosophical Society, January 2,
1891.
- LINNARSSON, J. G. O. Nekrolog. Neues Jahrbuch für Mineral-
ogie, etc., 1892, Bd. I.
- LORETZ, HERRN H. Bemerkungen über die Lagerung des Roth-
liegenden südlich von Ilmenau in Thüringen. Jahr-
buch der Königl. preuss. geologischen Landesanstalt.
1892.
- MANZOLD, G. Ueber die Altersfolge der vulkanischen Ge-
steine u. der Ablagerungen des Braunkohlengebirgs in
Siebengebirge. Inaug. Diss. Kiel, 1888.
- MARTIN, K. Ein neues Telescopium u. die Beziehung dieser
Gattung zu *Nerinea*. Sammlung d. Geol. R. Mus. in
Leiden, Ser. I, Vol. 4, pp. 232-237.
- Eine neue Orbitolina von Santander, Neues Jahrb. für
Mineralogie, etc. 1891, Bd. I, pp. 58-64. Mit Tafel II.
- MATHEW, W. D. Contributions from the Geological Depart-
ment of Columbia College. Transactions of the New
York Academy of Sciences, vol. XII. Issued April
10th, 1893.
- McGEE, W. J. Some definitions in Dynamical Geology. Geolog-
ical Magazine, Nov., 1888. Decade III, vol. V, No. 11,
p. 489.
- Encroachments of the sea. Forum, June, 1890, pp. 437-
449.
- The World's Supply of Fuel. Ibid. July, 1889, vol. VII,
pp. 553-566.
- Paleolithic man in America. His Antiquity and Environ-
ment. Popular Science Monthly, Nov., 1888, pp. 20-36.
- Notes on the Geology of Macon County, Missouri.

- McGEE, W. J.—continued. Three Formations of the Middle Atlantic Slope. *Amer. Journ. Science*, vol. XXXV, (Feb., Apr., May and June, 1888.)
- The Flood Plains of Rivers. *Forum*, April, 1891, pp. 221-234.
- The Appomattox Formation in the Mississippi Embayment. (Abstract.) *Bull. Geol. Soc. Am.*, vol. 2, pp. 1-6.
- The geologic Antecedents of Man in the Potomac Valley. *Amer. Anthropologist*, vol. II, No. 3, (1889) pp. 1-8.
- The Southern Extension of the Appomattox Formation. *Amer. Jour. Sci.*, vol. XL, July, 1890; pp. 15-41.
- The Field of Geology and its Promise for the Future. *Bulletin of the Minnesota Academy of Natural Sciences*, vol. III, No. 2; pp. 191-206.
- An Account of the Progress in Geology for the years 1887-1888. *Smithsonian Report for 1888*, pp. 217-270.
- MICHAEL, P. Ueber die Saussurit Gabbros des Fichtelgebirges. *Inaug. Diss. Jena*, 1887.
- MILLEE, S. A. A Description of some Lower Carboniferous Crinoids from Missouri. (Bulletin No. 4 published by the Geological Survey of Mo.)
- MUNTHE, H. Studier over Baltiska Hafvets Quartara Historia. *Stockholm*, 1892.
- NEWTON, R. B. British Oligocene and Eocene Molluska. (See *British Museum Nat. Hist.*) 19c.
- NICKELGRUFVA, K. *Lessebo Borlag*. *Stockholm*, 1887.
- ORTON, E. Report on Occurrence of Petroleum, Natural Gas, and Asphalt Rock in Western Kentucky. *Frankfort*, 1889. 15b.
- OSBORN, H. F. A Memoir upon Loxolophon and Uintatherium. *Princeton*, 1881. 15b.

- OSBORN, H. F.—continued. Palæontological Report of the Princeton Scientific Expedition of 1877. Bull. No. 2. New York, 1878. 15b.
- OSBORN, H. F. AND WORTMAN, J. L. *Artionyx*, a New Genus of Ancl'yopoda. e
- PASSARGE, S. Das Roth im ostlichen Thuringen. Inaug. Diss, Jena, 1891.
- PETERSEN, J. Mikroskopische u. chemische Untersuchungen am Enstatitporphyrat aus den Cheviot Hills. Inaug. Diss. Kiel, 1884.
- POCTA, P. Ueber Spongien aus der Oberen Kreide Frankreichs i. d. K. Mineralog. Museum, Dresden. Mitth. a. d. K. Mineralog.-Geolog. und Præhistorischen Museum in Dresden. Heft 11, pp. 1-26,
- POTTER, W. B. The Character and Composition of the Lignite Coals of Colorado. Transactions Amer. Inst. of Mining Engineers, 1878. pp. 1-11.
- POWELL, J. W. Report on Geog. and Geol. Survey of the Rocky Mountain Region. Washington, 1877. 16d.
- Exploration of Colorado River, 1869-72. Washington, 1872. 17d.
- PUMPELLY, R. AND VAN HISE, C. R. Observations upon the Structural Relations of the Upper Huronian, Lower Huronian and Basement Complex on the North Shore of Lake Huron. Amer. Journ. Sci., vol. XLIII, pp. 225-232, 1892.
- PURGOLD, A. Die Meteoriten des Konigl. Mineralogischen Museums in Dresden. Abh. der Gesellschaft "Isis" in Dresden, 1882, Abh. VIII, pp. 3-14.
- ROSENBUSCH, H. Mikroskopische Physiographie der Massigen Gesteine. Geol. Magazine, 1887. Decade III, vol. IV, No. 3, p. 122. (Review.)

- SALISBURY, R. D. A Preliminary Paper on the Drift or Pleistocene Formations of New Jersey. Annual Report of State Geologist of N. J., 1892, pp. 35-108.
- SAMSON, F. A. Bibliography of the Geology of Missouri. Bulletin No. 2 of the Geological Survey of Mo. Jefferson City, Dec., 1890.
- SARASIN, CH. Die Conglomerate u. Breccien des Flysch in der Schweiz. Inaug. Diss. Strassburg, 1892.
- SCHILLBATH, H. Mikroskopische Untersuchung des Schaumkalkes bei Jena. Inaug. Diss. Jena, 1890.
- SCHMIDT, C. Metamorphose des Roches Alpines. Archives des Sciences Physiques et Naturelles. Vol. XXIX, No. 1, 1893.
- Ueber zwei neuere Arbeiten betreffend die Geologie des Kaiserstuhles im Breisgau.
- SMITH, A. E. Report on the Geology of north-eastern Alabama and adjacent portions of Georgia and Tennessee. Geological Survey of Alabama, Bulletin No. 4.
- Report on the Cahaba Coal Field. 15c.
- Report on the Coal Measures of the Plateau Region of Alabama. 15c.
- STEINMANN, G. Beiträge zur Geologie und Paläontologie von Sudamerika.
- STUART, J. T. Paleontology of Peoria County. Bull. of Scientific Association of Peoria, Ill. 1877, p. 22.
- TARR, R. S. The Carboniferous Area of Central Texas. Amer. Geologist, 1890, pp. 145-153.
- The Permian of Texas. Amer. Jour. Sci., vol. XLIII, pp. 9-12.
- The Phenomena of Rifting in Granite. Ibid., vol. XLI, pp. 267-272.

- TARR, R. S.—continued. The Central Massachusetts Moraine. *Am. Journ. Sci.*, vol. XLIII, pp. 141-145.
- Superimposition of the Drainage of Central Texas. *Ibid.*, vol. XLI, pp. 359-362.
- Reconnoissance of the Guadalupe Mountains. *Bulletin No. 3 of Geol. Survey of Texas*, 1892.
- A Hint with Respect to the Origin of Terraces in Glaciated Regions. *Amer. Journ. Sci.* vol. XLIV, pp. 59-61, 1892.
- The Relation of Secular Decay of Rocks to the Formation of Sediments. *Amer. Geologist*, vol. X, pp. 25-44, 1892.
- TURNER, H. W. Some Recent Contributions to the Geology of California. *Ibid.*, vol. XI, May, 1893.
- Glacial Pot-Holes in California. *Amer. Jour. Sci.*, vol. XLIV, pp. 453-459, plate IX.
- Mohawk Lake Beds. *Bul. Phil. Soc. Washington*, vol. XI, pp. 385-410, pl. 4, 1891.
- The Geology of Mount Diablo, California. *Bull. Geol. Soc. America*, vol. 2, pp. 383-414, pl. 15, 1891.
- ULRICH, A. Palæozoische Versteinerungen aus Bolivien. *Inaug. Diss. Strassburg*, 1892.
- U. S. HYDROGRAPHIC OFFICER. The New Volcano of the Bering Sea. *Science*, vol IV, No. 92, pp. 432-434.
- UPHAM, W., LEVERETT, F., SHALER, N. S., AND CROSBY, W. O. Discussion of the Climatic Conditions of the Glacial Period. *Proceedings of the Boston Society of Natural History*, vol. XXIV, pp. 450-467.
- UPHAM, W. A Classification of Mountain Ranges according to their Structure, Origin and Age. *Appalachia*, vol. VI, No. 3, pp. 191-207.
- A Review of the Quaternary Era, with Special Reference to the Deposits of Flooded Rivers. *Amer. Journ. Sci.*, vol. XLI, pp. 33-52.

- UPHAM, W.—continued. Glacial Lakes in Canada. Bull. Geol. Soc. America, vol. II, pp. 243-276, 1891.
- VAN HISE, C. R. The Iron Ores of the Penokee-Gogebic Series of Michigan and Wisconsin. Amer. Jour. Sci., vol. XXXVII, pp. 32-39, with pl. 2.
- The Iron Ores of the Marquette District of Michigan. Ibid., vol. XLIII, pp. 116-132.
- An Attempt to Harmonize some Apparently Conflicting Views of Lake Superior Stratigraphy. Ibid., vol. XLI, pp. 117-137.
- Upon the Origin of the Mica-Schists and Black Mica-Slates of the Penokee-Gogebic Iron Bearing Series. Ibid., vol. XXXVII, pp. 456-460, pl. 10.
- The Pre-Cambrian Rocks of the Black Hills. Bull. of Geol. Soc. America, vol. I, pp. 203-244. Washington, 1890.
- An Historical Sketch of the Lake Superior Region to Cambrian Time. Journal of Geology, vol. I, No. 2, Feb.-March, 1893.
- VOGDES, A. W. On Some New Sedalia Trilobites. Trans. St. Louis Acad. Sci., vol. V, Nos. 3-4, pp. 1-4, pl. 12-15.
- Courses of Sciences applied to Military Art, Part I Geology, and Military Geography. Fort Monroe, Vt., 1884.
- VOGT, J. H. L. Granitens og syenitens baenkning i forhold til den nuvaerende overflade. Stockholm, 1879.
- Salten og Ranen. Kristiania, 1891.
- Nogle bemaerkinnger om granit. Christiania, 1881.
- Norske ertsforekomster, I-VII. Kristiania, 1884.
- Skiktete moraener. Christiania, 1881.

- WADSWORTH, M. E. The Fortieth Parallel Rocks. Proc. Boston Soc. of Nat. Hist., vol. XXII, pp. 412-432.
- Notes on Rocks and Ore Deposits in the Vicinity of Notre Dame Bay, Newfoundland. 2 copies. Amer. Journ. Sci., vol. XXVIII, pp. 94-104.
- Meteorites, *Ibid.*, vol. XXVI, pp. 32-38.
- On the Relation of the Quincy Granite to the Primordial Argillite of Braintree, Mass. Proc. Boston Soc. Nat. Hist., vol. XXI, pp. 274-277.
- Notes on the Lithology of the Island of Jura, Scotland. *Ibid.*, vol. XXII, pp. 485-489.
- On the Trachyte of Marblehead Neck, Mass. *Ibid.*, vol. XXI, pp. 288-294.
- Some Instances of Atmospheric Action on Sandstone. *Ibid.*, vol. XXII, pp. 202-203.
- Methods of Instruction in Mineralogy. Popular Sci. Monthly, 1883, pp. 754-759.
- On a Supposed Fossil from the Copper-Bearing Rocks of Lake Superior. Proc. Boston Soc. Nat. Hist., vol. XXIII, pp. 208-211.
- On the Relation of the "Keweenaw Series" to the Eastern Sandstone in the Vicinity of Torch Lake, Mich. *Ibid.*, vol. XXIII, pp. 172-180.
- The Theories of Ore Deposits. *Ibid.*, vol. XXII, pp. 197-208.
- The Dona Inez and the Llano del Inca Meteorites from Atacama, Chili, with Meteorological Description. From Descrip. of New Meteorites, by Edwin E. Howell. Proc. Rochester Acad. Sci., vol. I, pp. 93-98.
- The South Trap Range of the "Keweenaw Series." Amer. Journ. Sci., vol. XLII, pp. 417-419.

- WADSWORTH, M. E.—continued. On the Relations of the Eastern Sandstone of Keweenaw Point to Lower Silurian Limestone. *Ibid*, 1891, vol. XLII.
- On the Classification of Rocks. *Bulletin of Museum Comparative Zoology at Harvard College, Cambridge, Mass.* 1879, vol. V, No. 13, pp. 275-287.
- Preliminary Description of the Peridotites, Gabbros, Diabases and Andesytes of Minnesota. *Geol. and Nat. Hist. Survey of Minn.*, 1887.
- A Description and Classification of the Rocks of the Cordilleras.
- Lithology of Some Cordillerian Volcanoes. *Geol. and Palaeontology.*
- On the Presence of Syenite and Gabbro in Essex Co., Mass. *Geol. Magazine. Decade III, vol. II, No. 5, p.* 207.
- AND DICKERMAN, Q. E. An Olivine-Bearing Diabase, from St. George, Me.
- AND WHITNEY, J. D. The Azoic System and its Proposed Subdivisions. *Bull. Mus. Comp. Zool.*, vol. VII, pp. 331-565.
- WAHNSCHAFFE, F. Bemerkung zu dem Funde eines Geschiebes mit *Pentamerus borealis* bei Havelberg. *Zeitsch. deutsch. Geolog. Gesellsch.* 1887. pp. 140-149.
- Die Susswasser Fauna u. Susswasser-Diatomeen-Flora im Unteren Diluvium der Umgegend von Rathenow, *Ibid.*, 1885, pp. 260-281.
- Die Bedeutung des Baltischen Hohenrucksens für die Eiszeit. Berlin, 1889.
- Zur Frage der Oberflächengestaltung im Gebiete der baltischen Seenplatte. Berlin, 1888.
- Mittheilungen über das Alluvium der Rathenower Gegend. *Zeitsch. deutsch. Geolog. Gesellsch.*, 1885, pp. 124-131.

- WAHNSCHAFFE, F.—continued. Beitrag zur Lossfrage. Zeitsch. deutsch. Geolog. Gesellsch. 1890, pp. 328-346.
- Ueber zwei conchylienführende Lossablagerungen nordlich vom Harz. *Ibid.*, 1886, pp. 253-258.
- Mittheilungen über das Glacialgebiet Nordamerikas. I. Die Endmoränen v. Wisconsin und Pennsylvanien. *Ibid.*, 1892.
- Ueber einen Grandrücken bei Lubasz. Jahrbuch der königl. preuss. geologischen Landesanstalt, Berlin, 1892.
- AND LOSSEN, K. A. Beiträge zur Beurtheilung der Frage nach einer einstigen Vergletscherung des Brocken Gebietes. Zeitsch. deutsch. Geolog. Gesellsch. 1880, pp. 124-136.
- AND SALISBURY, R. D. Neue Beobachtungen über die quar-
tarbildung der Magdeburger Borde. *Ibid.*, 1888, pp. 262-273.
- WALCOTT, C. D. Correlation Papers, Cambrian. Bull. U. S. Geol. Survey, No. 81.
- Cambrian Faunas of North America. Bull. U. S. Geol. Survey, No. 30.
- Cambrian Fossils from Mount Stephens, Northwest Territory of Canada. Amer. Journ. Science, vol. XXXVI, pp. 161-166.
- Appendages of the Trilobite. Science, vol. III, No. 57, p. 279.
- Paleozoic Notes:—New Genus of Cambrian Trilobites, *Mesonacis*. Am. Journ. Science, vol. XXIX, pp. 329-331.
- Fauna of the "Upper Taconic" of Emmons, in Washington County, N. Y. *Ibid.*, vol. XXXIV, pp. 187-201, pl. I.
- Discovery of Fossils in the Lower Taconic of Emmons. Proceedings of the Am. Assoc. for the Advancement of Science, vol. XXXVI, p. 213.

- WALCOTT, C. D.—continued. The Taconic System of Emmons and the Use of the name Taconic in Geological Nomenclature. *Amer. Jour. Sci.*, vol XXXV, pp. 229-401, pl. III.
- WHEELER, G. M. Explorations in Nevada and Arizona. Washington, D. C., 1871. 17d.
- WICHMANN, A. AND MARTIN, K. Sammlungen des Geologischen Reichs-Museums in Leiden. 2te Serie. Bd. I, mit 5 tafeln, 1887-1889.
- WILLIAMS, G. H. On a New Plan Proposed for Future Work upon the Geological map of the Baltimore Region. *Johns Hopkins University Circulars*, No. 59, July, 1887.
- The Petrography and Structure of the Piedmont Plateau in Maryland. *Bull. Geol. Soc. Amer.*, vol. 2, pp. 301-322, pl. 12.
- The Nickel and Copper Deposits of the Sudbury District, Canada. *Ibid.*, pp. 125-140.
- Note on the Eruptive Origin of the Syracuse Serpentine. *Ibid.*, vol. 1, pp. 533-534.
- Geological and Petrographical Observations in Southern and Western Norway. *Ibid.*, pp. 551-553.
- Notes on Some Eruptive Rocks from Alaska. *National Geographic Magazine*, vol. IV, pp. 63-74.
- Geology of Baltimore and its Vicinity. *Guide Book of Baltimore*, prepared for the Amer. Inst. of Mining Engineers, February, 1892.
- A Summary of Progress in Mineralogy and Petrography in 1885. *Amer. Naturalist*, 1885.
- The Gabbros and Diorites of the Cortlandt Series. *Amer. Jour. Sci.*, Vol. XXXV, pp. 438-448.
- Contributions to the Geology of the Cortlandt Series, near Peekskill, N. Y. *Ibid.*, vol. XXXVI, pp. 254-269, pl. 6.

WILLIAMS, G. H.—continued, The Non-feldspathic Intrusive Rocks of Maryland and the Course of their Alteration. Amer. Geologist, 1890, pp 35-49.

— On a New Petrographical Microscope of American Manufacture. Amer. Journ. Sci., vol. XXXV, pp. 114-117.

— The Geology of Fernando de Noronha. Ibid., vol. XXXVII, pp. 145-189.

— On the Serpentine (Peridotite) Occurring in the Onondaga Salt Group at Syracuse, N. Y. Ibid., vol. XXXIV, pp. 137-145.

— Some Modern Aspects of Geology. Popular Sci. Monthly, 1889, pp. 640-648.

WINCHELL, A. Michigan. Condensed popular Sketches of the Topography, Climate and Geology of the State. Walling's Atlas of Michigan, 1873.

WINCHELL, N. H. On the Geology of Sandusky, Seneca, Wyandot and Marion Counties of Ohio. Columbus, 1872. 15b.

—The Drift Deposits of the Northwest. Popular Sci. Monthly, 1873, pp. 202-230.

—The Devonian Limestones in Ohio. Proc. of Amer. Ass. for Advancement of Science, 1873, pp. 100-104.

—Notes on the Drift Soils of Minnesota. 4th Annual Report of Commissioner of Statistics of Minn., 1873.

WINSLOW, A. A preliminary Report on the Coal Deposits of Missouri from field work prosecuted during the years 1890 and 1891, with 131 illustrations. Jefferson City, 1891. 14a.

—The Missouri Coal Measures and the Conditions of their Deposition. Bull. Geol. Soc. Am., vol. III, 1891, p. 109.

—The Geology and Mineral Products of Missouri. "Missouri at the World's Fair," St. Louis, 1893.

- WINSLOW, A.—continued. Notes on the Cambrian in Missouri and the Classification of the Ozark Series. Amer. Journ. Sci., vol. XLV, March, 1893.
- WOODWARD, H. A Guide to the Exhibition Galleries of Geology and Palæontology. Part 1, Fossil Mammals and Birds. Part 2, Reptiles, Fishes and Invertebrates. (See British Museum Nat. Hist). 19c.
- WULFING, E. A. Untersuchung eines Nephelinsyenit aus dem mittleren Transvaal, Sud-Afrika. Neues Jahrbuch für Mineralogie, Geologie und Palæontologie, 1888, Band II, p. 16.

HISTORY.

SERIALS.

- MADRID [Spain] Real Academia de la Historia.
Boletin, Vols. I, pt. 5; V, 5, 6; VI, 1-4; VII, VIII, 2, 4, 6; IX, 1-3, 5; X, 2-6; XI, 2, 4-6; XII, 2, 4, 5; XIV, 1-4; XV, 2, 4-6; XVI-XVIII, XIX, 1-3, 5, 6; XX, XXI, 1-5. + 27c
- MUNICH [Germany] K. b. Akademie der Wissenschaften.
Sitzungsberichte der philosophisch-philologischen und historischen Classe, 1887, Vol. II, Nos. 2, 3; 1888, I, 1. + 8d
- REGENSBURG [Germany] Historischer Verein von Oberpfalz und Regensburg.
Verhandlungen, Vols. XXXIV-XXXIX, XLI, XLII. + 26c
- RIO DE JANEIRO [Brazil] Instituto Historico e Geographico Brasileiro.
Revista Trimensal, Vol. L, Fol. 1, 2; LIV, 1, 2. + 1d

- STOCKHOLM [Sweden] Konigl. Vitterhets Historie och Antiquitets Akademiens.
 · Manadsblad, 1885-1889, 1890. + 27d
- TOPEKA [Kansas] Kansas State Historical Society.
 Kansas Historical Collections, Vol IV. + 27b
 Annual Report, 8th. + 27b
- WORCESTER [Mass.] Worcester Society of Antiquity.
 Proceedings, Nos. 1, 2, 4, 5, 7, 8, 13, 17, 19-27,
 31, 35, 39. + 25e

NON-SERIALS.

Pamphlets, 27c.

- ABERG, K. V. K. De Diplomatiske forbindelserna mellan Sverige och storbritannien under Gustaf in Adolfs Krig Emot Napoleon. Upsala, 1890.
- ACQUOY, J. G. R. Het Klooster te Windesheim en Ziju Invloed (Uetgegeven door het Provinciaal Utrechtsch Genootschap van Kunsten en Wettenschappen.), vols. I and II. 27b.
- DE ARANJO Porto-Alegre Manoel. Colombo Poema. Rio Janeiro, 1892.
- ARMSTRONG, W. Discussions on the Abolition of Patents for Inventions in the United Kingdom, France, Germany and the Netherlands. London, 1869. 26b.
- BAENTSCH, BRUNO. Das Zeitalter des Heiligkeits-Gesetzes. Habilitationsschrift, Jena, 1893.
- BRINTON, D. G. The Prophetic and Historic Records of the Mayas of Yucatan. Proc. of Numismatic and Antiquarian Society of Philadelphia. 1882.
- BROCKHAUS, F. Ueber das canonische Recht. Kiel, 1888.
- BUGGE, S. Rune-indskriften poa ringen i forska Kirke i Nordre Helsingland. Christiania, 1877.

- CARO, G. Die Verfassung Genuas zur Zeit des Podestats. Inaug. Diss. Strassburg, 1891.
- CASTILHO, A. M. Etudes Historico-Geographiques. Lisbon, 1870.
- CHAGAS, M. P. Os Descobrimentos Portuguezes e os de Colombo. Lisbon, 1892.
- DECOSTA, B. F. Sailing directions of Henry Hudson prepared for his use in 1608.
- DIECKMEIER, A. Die Stadt Cambrai. Inaug. Diss. Jena, 1889.
- FAHRAENS, G. R. Om forandringer af sveriges allianssystem åren 1680–1682 i dess sammenhang med de europiska förvecklingarna. Upsala, 1891.
- FRIESE, K. Ueber den äusseren Gang der Verhandlungen beim Frieden v. Oliva. Inaug. Diss. Kiel, 1890.
- GAUTER, L. Die Provinzialverwaltung der Triumvirn. Inaug. Diss. Strassburg, 1892.
- HANEL, A. Das Kaiserthum. Inaug. Diss. Kiel, 1892.
- HARTOG, J. De Spectatoriale Geschriften van 1741–1800. Utrecht, 1872.
- HENNEBERG, H. Die Politischen Beziehungen zwischen Deutschland und Frankreich unter König Albrecht I, 1289–1308. Inaug. Diss. Strassburg, 1891.
- HESKEL, A. Die Historia Sicula des Anonymus Vaticanus und des Isanfredus Malaterra. Inaug. Diss. Kiel, 1891.
- HINZ, C. H. Zur Beurtheilung Appians u. Plutarchs in der Darstellung der Ereignisse v. der Ermordung Cæsars bis zum Tode des M. Brutus. Inaug. Diss. Jena, 1891.
- HOMES, H. A. The Palatine Emigration to England in 1709. Trans. of Albany Institute, vol. VII, pp. 106–134.
- KARLSSON, K. H. Den Svenske Konungens Domsträtt och Formerna för dess Utöfning under Medeltiden. Upsala, 1890.

- KAYSER, R. *Placidus von Nonatula De Nonore ecclesiae.* Inaug. Diss. Kiel, 1888.
- KREBS, J. *Zacharias Allerts Tagebuch aus dem Jahr 1627.* Breslau, 1887. 27b.
- KRIEHN, G. *The English Rising in 1450.* Inaug. Diss. Strassburg, 1892.
- LIEBLEIN, J. *Recherche sur la Chronologie Egyptienne d'apres les listes Genealogiques,* Christiania, 1873.
- Handel und Schiffahrt auf dem rothen Meere in alten Zeiten.* Christiania, 1886.
- LIPP, M. *Die Marken des Frankreichs unter Karl den Grossen.* Theil I. Inaug. Diss. Königsberg, 1892.
- LORENZ, E. *Thuringische Katastrophe vom Jahre 531.* Inaug. Diss. Jena, 1891.
- LUNDIN, C. F. *Wismars Pantsattande till Meklenburg-Schwerin.* Publications Upsala, 1892.
- MARQUARDT, G. *Die Historia Hierosolymitana des Rubertus Monachus.* Inaug. Diss. Königsberg, 1892.
- MEYER, W. *Das Werk des Kanzlers Gislebert v. Mons besonders als Verfassungsgeschichtliche Quelle betrachtet.* Inaug. Diss. Jena, 1888.
- MEZ, A. *Geschichte der Stadt Harran in Mesopotamien bis zum Einfall der Araber.* Inaug. Diss. Strassburg, 1892.
- MICHELER, J. *Das Tabakwesen in Bayern v. dem Bekanntwerden des Tabaks bis zur Einführung eines Herdslattgeldes.* 1717. Inaug. Diss., 1887.
- MOSHACK, R. *Die Reichslandvogtei in der Wetterau.* Inaug. Diss. Jena, 1888.
- MUNSEL, J. *A Chronology of Paper and Papermaking.* Albany, 1870. 26b
- NIELSEN, Y. *Diplomatiske Aktstyker vedkommende Norges Opgjor med Danmark, 1818-1819.* Christiania, 1890.

- NITZSCH, F. Die Idee u. die Stufen des Opferkultes, ein Beitrag zur allgemeinen Religionsgeschichte. Kiel, 1889.
- NORDWALL, J. E. Svensk-ryska underhandlingar fore freden i Kardis (1658-61). Upsala, 1890.
- NUTZEL, H. Munzen der Basuliden nebst einem Abriss der Geschichte dieser Jemenischen Dynastie. Inaug. Diss. Jena, 1891.
- OSTEN, G. v. d. Die Handels- u. Verkehrssperre des deutschen Kaufmannes gegen Flandern, 1358-1360. Inaug. Diss. Kiel, 1889.
- PHILLIPS, H. An Account of the Congo Independent State. Proc. Amer. Phil. Soc., vol. XXVII, pp. 459-476.
- RAUCH, JACOB. Kritische Bemerkungen zu einigen Quellen der Geschichte Rudolfs von Hapsburg. Inaug. Diss. Jena, 1893.
- REGNER, P. B. Kriget och tillstandet i vesterbotten 1809, Jamto foregaende historik ofver Ryssarnes infall i vesterbotten pa 1700-talet. Upsala, 1891.
- RYDFORS, A. De diplomatiska forbindelserna mellan sverige och England, 1624-1630. Upsala, 1890.
- SANDREGEN, M. Till historien om statshualfningen i sverige 1809. Upsala, 1890.
- SCHRODER, H. Zur Waffen- u. Schiffskunde des deutschen Mittelalters bis um das Jahr 1200. Inaug. Diss. Kiel, 1890.
- PEREIRA DA SILVA, I. M. Christovam Colombo eo Descobrimto da America. Rio Janeiro, 1893.
- SMITT, I. Det Norske Landbrugs Historie i Tidsrummet 1815-1870. Christiania, 1876.
- STAVENOW, L. Om viksradsvalen under frihetstiden bidrag til Svenska riksradets historia. Upsala, 1890.

- V. TERREY, G. Cardinal Albrecht von Brandenburg und das Halle'sche Heiligthumsbuch von 1520. Inaug. Diss., Strasburg, 1892.
- TURNER, F. J. The Character and Influence of the Indian Trade in Wisconsin.— Johns Hopkins University Studies, Historical and Political Science, Series IX, Nos. 11 and 12.
- ULRICI, E. Die Ansiedlungen der Normanen in Island, Gronland u. Nord-Amerika in 9ten, 10ten and 11ten Jahrhundert.
- UNDET, I. Indskrifter framiddelalderen i Thronhjems domkirke. Christiania, 1888.
- UNZER, A. Die Convention v. Klein-Schnellendorf. Inaug. Diss. Kiel, 1889.
- Hertzberges Anteil an den preussisch-osterreichischen Verhandlung 1878-79. Inaug. Diss. Kiel, 1890.
- VACONIUS, FRANZ. Die Messianische Idee der Hebraeer geschichtlich entwickelt. Teil I. Inaug. Diss. Jena.
- VESSBERG, G. W. Om svenska ricksdagen ders sammansattning och Verksamhetsformer 1772-1809. Upsala, 1889.
- WAGNER, M. Untersuchung uber die Ryswijker Religions-Klausel. Inaug. Diss. Jena, 1889.
- WOEBLING, GUSTAV. Die mittelalterlichen Lebensbeschreibungen des Bonifatius ihrem Inhalte nach untersucht, verglichen und erlautert. Inaug. Diss. Jena.
- WHITNEY, S. H. The Early History of the Kennebec Valley.
- WIRTZ, L. Die Politik der Katharina v. Medici u. deren Zusammenhang mit den auswartigen Beziehungen u. inneren Verhaltnissen Frankreichs, 1563-1565. Inaug. Diss. Jena, 1891.

LAW.

NON-SERIALS.

Pamphlets, 30c.

- BRANDT, F. Grundtraekkene i. den Aeldste Norske Procers. Christiania, 1874.
- HERTZBERG, E. De gamle loves mynding. Christiania, 1889.
- KATZ, P. A. Beitrage zur Lehre v. den Schriftsätzen. Inaug. Diss. Kiel, 1883.
- KJELLEN, R. Studier vorande Ministeransvarigheten. Ioch II. Upsala, 1890.
- LANDGREN, K. G. Om Konungens Sanktionsratt vid Forandring eller Upphafvande af Statens Ordinarie Inkomster. Upsala, 1890.
- NIEDEN, W. zur. Das Miteigenthumverhaltniss am Gemeinschaftlichen Sklaven u. der darauf beruhende Rechtserwerb desselben fur die mehreren Herren. Inaug. Diss. Jena, 1891.
- NOYE, W. Maxims of the Laws of England. Albany, 1870. 27b.
- RUHL, A. Zur Reform der Armengesetzgebung. Inaug. Diss. Jena, 1888.
- SEELIG, G. Die Erbfolgeordnung des Schwabenspiegels. Inaug. Diss. Kiel, 1890.
- VARENIVS, O. Om Riksforestandarskap enligt sveriges och Norges Grundlagar. Publication Upsala, 1892.

LANGUAGE AND LITERATURE (GREEK).

NON-SERIALS.

Pamphlets, 30d.

- AARS, J. Das Gedicht des Simonides in Platons Protagoras. Christiania, 1888.
- ADAMS, C. D. De periodorum formis et successionibus in Demosthenis oratione Chersonesitica. Inaug. Diss. Kiel, 1891.
- BLARS, F. Die Entdeckungen auf dem Gebiete der Klassischen Philologie im Jahre 1891. Inaug. Diss. Königsberg, 1892.
- BURCKHARDT, LUDOVICUS AUGUSTUS. Dse Hieroclis Synecdemii codicibus commentatio. Inaug. Diss. Leipzig.
- CLAMON, F. De Scholiis veteribus in Aves Aristophanis compositis. Inaug. Diss. Kiel, 1881.
- COMPARETTI, D. Sulla Epistola Ovidiana di Saffo a Faone. Florence, 1876. 26b
- FRIEDRICHSMEIER, F. De Luciani re metrica. Inaug. Diss. Kiel, 1889.
- GERBER, T. Quae in commentariis a Gregorio Corinthio in Hermogenem scriptis vetustiorum commentariorum vestigia deprehendi possint. Inaug. Diss. Kiel, 1891.
- GRIGORAKIS, G. ΣΥΓΚΡΙΣΙΣ ΤΩΝ ΣΧΟΛΙΩΝ ΤΩΝ ΦΟΙΝΙΣΣΩΝ ΤΟ ΥΕΡΠΗΛΙΔΟΥ ΠΡΟΣ ΤΟ ΤΟΥΤΩΝ ΚΕΙΜΕΝΟΝ. Inaug. Diss., 1890.
- HAGEN, P. Quaestiones Dioneae. Inaug. Diss. Kiel, 1887.
- HARRIES, H. Tragici Graeci qua arte usi sint in describenda insania. Inaug. Diss. Kiel, 1891.
- HARS, H. De Herodis Attici oratione. ΠΕΡΙ ΠΟΛΙΤΕΙΑΣ. Inaug. Diss., 1880.

- HELMBOLD, H. Aristophanis Pax superstes utrum prior sit an retractata. Inaug. Diss. Jena, 1890.
- HEMPEL, O. Quaestiones Theocriteae. Inaug. Diss. Kiel, 1881.
- HIRSCH, R. De animarum apud antiquos imaginibus. Inaug. Diss., 1889.
- KAEHLEB, F. De Aristophanis Ecclesiazuson tempore et choro quaestiones epicriticae. Inaug. Diss. Jena, 1889.
- KEHMPTZOW, F. De Quinti Smyrnaei fontibus ac mythopoeia. Inaug. Diss. Kiel, 1891.
- KERSTEN, F. De ellipseos usu Luciano. Inaug. Diss. Kiel, 1889.
- KJELLBERG, L. De cyclo epico quaestiones selectae. Publication Upsala, 1890.
- LEES, J. T. *AIKANIKOS AIOGOS* in Euripides. Diss. Johns Hopkins, 1891.
- MEINHARDT, PAULUS. De forma et usu juramentorum, quae inveniuntur in comicorum graecorum et Platonis, Xenophontis, Luciani sermone. Inaug. Diss. Jena.
- LINDEMANN, H. De dialecto Ionica recentiore. Inaug. Diss. Keil, 1889.
- LUDWICH, A. Lectiones Pseudophocylideae, 1892.
—Herodiani technici reliquiarum supplementum, 1891.
- LUEBBERT, G. De amnestia anno CCCCI, a. Chr. u. ab Atheniensibus decreta. Inaug. Diss. Kiel, 1881.
- MALCHIN, J. De Choricii Gazaevi veterum Graecorum scriptorum studiis. Ibid., 1884.
- MEYERSAHM, H. Deorum nomina hominibus imposita. Ibid., 1891.
- NILEN, N. Annotationes Lucianæ. Publication Upsala, 1889.
- OSTBYE, P. N. Om plan og komposition ix Thukydidis graeski historie. Christiania, 1888.

- RISBERG, B. De nonnullis locis Agamemnonis Aeschyleae scribendis et interpretandis. Publication Upsala, 1891.
- SCHMIDT, C. De articulo in nominibus propriis apud Atticos scriptores pedestres. Inaug. Diss. Kiel, 1889.
- SCHUCHT, H. De documentis oratoribus Atticis insertis et de litis instrumentis prioris adversus Stephanum orationis Demosthenicae. Inaug. Diss. 1892.
- SCHWARTZBACH, F. B. Libellus *περι ἐρμηνείας* qui Demetrii nomine inscriptus est quo tempore compositus sit. Inaug. Diss. Kiel, 1890.
- SEEGERS, H. Neue Beiträge zur Textkritik v. Hartmann's Gregorius. Ibid., 1890.
- SPITZER, J. Lautlehre des Arkadischen Dialektes, Ibid., 1883.
- WASSNER, J. De Heroum apud Graecos cultu. Ibid., 1883.
- WOLTERSTORFF, R. Sophoclis et Euripidis Electrae quo ordine sint compositae. Inaug. Diss. Jena, 1891.

LANGUAGE AND LITERATURE (LATIN).

NON-SERIALS.

Pamphlets, 30d.

- AMANN, R. De Coripp priorum portarum latinorum imitatore. Inaug. Diss. Kiel, 1885.
- BAAR, J. De Bacchidsibus Plautina quæstiones. Inaug. Diss. Kiel, 1891.
- BOSCK, C. De metris Horatii lyricis. Inaug. Diss. Kiel, 1880.
- BUCHTENKIRCH, E. Der syntaktische Gebrauch des Infinitiv in Oecheve's de Regimine Principium. Inaug. Diss. Jena, 1889.

- BURCKAS, V. De Tib. Claudii Donati in Æneida commentario. Inaug. Diss. Jena, 1888.
- CHRISTIANSEN, J. De apicibus et i longis inscriptionum latin-arum. Inaug. Diss. Kiel, 1889.
- DIETZE, J. Quæstiones Hyginianæ. Inaug. Diss. Kiel, 1890.
- ELMER, H. C. The Copulative conjunctions que, et, atque, in the inscriptions of the Republic, in Terence and in Cato. Amer. Journ. of Philology, vol. VIII, No. 3, pp. 1-39.
- FEHRNBORG, O. I. De verbis latinis in vo divisas desinentibus. Upsala, 1889.
- FERBER, C. Utrum metuerit Tiberius Germanicum necne quæritur. Inaug. Diss. Kiel, 1890.
- FRIIS, J. A. Lexicon Lapponicum.
- FRITZSCHE, R. Quæstiones Lucanæ. Inaug. Diss. Jena, 1892.
- GEBHARD, E. De D. Junii Bruti genere dicendi. Inaug. Diss. Jena, 1891.
- HANOW, R. De Iuliano Toletano. Inaug. Diss. Jena, 1891.
- HANSEN, M. De tropis et figuris apud Tibullum. Inaug. Diss. Kiel, 1881.
- HEDQUIST, W. De formis syncopatis quæ vocantur, verbi Latini. Publication Upsala, 1891.
- HEINRICKE, G. De Ciceronis doctrina quæ pertinet ad materiam artis rhetoricae et ad inventionem. Inaug. Diss., 1891.
- HILGENFELD, H. L. Annaei Senecae epistulae morales quo tempore sint scriptae collectae editae. Inaug. Diss., 1890.
- HOENFFT, L. H. Musa. Amsterdam, 1874.
- Hollandia. Amsterdam, 1876.
- Ad Procum Satira. Amsterdam, 1875.
- Juditha et Adolescentes Meditatio. Amsterdam, 1884.

- KELTER, E. Apulei quae fertur physiognomoniam quando composita sit. Inaug. Diss. Kiel, 1890.
- MAYEN, G. De particulis quod quia quoniam quomodo ut pro acc. cum infinitivo post uerba sentiendi et declarandi positae. Inaug. Diss. Kiel, 1889.
- MOLKEN, H. In Commenstarium de bello africano quaestiones criticae. Inaug. Diss. Jena., 1892.
- NEUMANN, H. De Plinii Dubii Sermonis Libris Charisii et Prisciani fontibus. Inaug. Diss. Kiel, 1881.
- RADTKE, J. Observationes criticae in Cornifici libros de arte rhetorica. Inaug. Diss., 1892.
- REICHE, F. Chronologie der letzten 6 Bücher des Ammianus Marcellinus. Inaug. Diss. Jena., 1889.
- RUBENSOHN, O. Die Mysterienheiligtümer in Eolensis und Samrothrake. (Erster Theil.) Publication Strasburg, 1892.
- SCHULTZE, E. De legione Romanorum XIII gemina. Inaug. Diss. Kiel, 1887.
- WENDLING, A. De peplo Aristotelico quaestiones selectae. Inaug. Diss. Jena, 1891.
- WIEDING, G. De aetate Consolationis ad Liviam. Inaug. Diss. Kiel, 1888.
- WITTE, E. Ammianus Marcellinus quid iudicaverit de rebus divinis. Inaug. Diss. Jena, 1891.

LANGUAGE AND LITERATURE (ENGLISH AND ANGLO-SAXON).

NON-SERIALS.

Pamphlets, 30d.

- CARSTENS, B. Zur Dialectbestimmung des Mittelenglischen Sir Firumbras, eine Lautuntersuchung. Inaug. Diss. Kiel, 1884.
- FOSTER, T. G. Judith Studies in Metre, Language and Style. Inaug. Diss. Strassburg, 1892.
- FUHRMANN, J. Die Alliterierenden Sprachformeln in Morris' Early English Alliterative Poems u. im Sir Gawayne and the Green Knight. Inaug. Diss. Kiel, 1886.
- GOEDERS, C. Zur Analogiebildung im Mittel und Neuenglischen, ein Beitrag zur Kenntniss der Sprachgeschichte. Inaug. Diss. Kiel, 1874,
- GRAF, A. Das Perfectum bei Chaucer. Eine Syntactische Untersuchung. Inaug. Diss. Kiel, 1888.
- HARSTRICK, A. Untersuchung über die Praepositionen bei Alfred dem Grossen. Inaug. Diss. Kiel, 1890.
- HEESCH, G. Über Sprache und Versbau des Halbsachsischen Gedichts, "Debate of the Body and the Soul." Inaug. Diss. Kiel, 1884.
- HOEFE, A. Lautuntersuchungen zu Osbern Bokenam's Legend-en. Inaug. Diss. Kiel, 1885.
- KOLLS, A. Zur Lanvalsage. Eine Quellen-untersuchung. Inaug. Diss. Kiel, 1886.
- KRAMER, G. Über Stichomythie und Gleichklang in den Dramen Shakespeares. Inaug. Diss. Kiel, 1889.
- LOWISCH, M. Zur Englischen Aussprache von 1650-1750 nach Frühenglischen Grammatiken. Inaug. Diss. Jena, 1889

- LUTGENS, C. *Über Bedeutung u. Gebrauch der Hilfsverba im Frühen Altenglischen.* Sculan and Willan. Inaug. Diss. Kiel, 1888.
- MULLER, Hugo. *Über Die Angelsächsischen Versus Gnomici.* Inaug. Diss. Jena, 1893.
- NEUMANN, M. *Ueber das Altenglische Gedicht von Judith.* Inaug. Diss. Kiel, 1892.
- RITZENFELDT, E. *Der Gebrauch des Pronomens, Artikels u. Verbs bei Thomas Kyd im Vergleich zu dem Gebrauch bei Shakespeare.* Inaug. Diss. Kiel, 1889.
- SCHULTZ, E. *Die Sprache der "English Gilds" aus dem Jahre 1389. Ein Beitrag zur Dialektkunde von Norfolk.* Inaug. Diss. Jena.
- TOLMAN, A. H. *The Style of Anglo-Saxon Poetry.* Trans. and Proc. of Modern Language Association of America, vol. III, pp. 1-31.
- *Studies in Macbeth.* Atlantic Monthly, vol. LXIV, No. 412, pp. 241-245.
- *Shall and Will and Should and Would.* Modern Language Notes. vol. VII, No. 4, pp. 1-3.
- WANDSCHNEIDER, W. *Zur Syntax des Verbs in Langley's Vision of William concerning Piers the Plowman, together with vita de Dowel, Dobet & Dobest.* Inaug. Diss. Kiel, 1887.
- WICHERS, P. *Über die Bildung der Zusammengesetzten Zeiten der Vergangenheit im Früh-Mittelenglischen.* Inaug. Diss. Kiel, 1889.

LANGUAGE AND LITERATURE (FRENCH)

NON-SERIALS.

Pamphlets, 30d.

ANDERSSON, H. Etude Linguistique sur Version de la legende de Theophile. Upsala, 1889.

BRAUNS, J. Über Quelle u. Entwicklung der altfranzösischen *Caucun de saint Alexis* verglichen mit der provenzalischen *Vida* sowie den altenglischen u. mittelhochdeutschen Darstellungen. Inaug. Diss. Kiel, 1884.

CRON, J. Die Stellung des attributiven Adjectives im Altfranzösischen. Inaug. Diss. Strassburg, 1891.

ELSNER, AVON. Über Form u. Verwendung des Personalpronomens im Altprovenzalischen. Inaug. Diss. Kiel, 1886.

FRANTZEN, J. J. A. A. Kritische Bemerkungen zu Fischarts Uebersetzung von Rabelais' *Gargantua*. Inaug. Diss. Strassburg, 1892.

HELLGREWE, W. Syntaktische Studien über Scarron's *Le Roman Comique*. Inaug. Diss. Jena, 1887.

HERTING, A. Der Versbau *Etienne Jodelle's*. * Abhandlung. Kiel, 1884.

HOFMANN, F. *Avoir* u. *estre* in den umschreibenden Zeiten des altfranzösischen intransitiven Zeitworts. Inaug. Diss. Kiel, 1890.

JOHANNSEN, H. Der Ausdruck des Concessivverhältnisses im Altfranzösischen. 1884.

KINNE, G. H. Formulas in the Language of the French Poet-Dramatists of the Seventeenth Century. Inaug. Diss. Strassburg, 1892.

- LINDSTROM, E. Anmärkingar till de Obetonade Vokalernas Bortfall i. narga Nordfranska Ortnamm. Publication Upsala, 1892.
- MATSCHKE, O. Die Nebensätze der Zeit im Altfranzösischen. Inaug. Diss. Kiel, 1887.
- NIENKIRCHEN, F. Alfred de Musset's Gedicht Sur la Paresse als zeitgenössische Satire mit ihren Beziehungen zu Mathurin Regnier im biographisch-literargeschichtlicher Commentar. Inaug. Diss. Jena, 1889.
- NISSEN, P. Der Nominativ der verbundenen Personalpronomina in den ältesten französischen Sprachdenkmälern. Inaug. Diss. Kiel, 1882.
- NORDFELT, A. Etudes la chanson de enfances vivien. Stockholm, 1891.
- ORLOPP, W. Ueber die Wortstellung bei Rabelais. Inaug. Diss. Jena, 1888.
- QUIEHL, K. Der Gebrauch des Konjunktivs in den ältesten französischen Sprachdenkmälern bis zum Rolandsliede einschliesslich. Inaug. Diss. Kiel, 1881.
- RAEDER, H. Die Tropen u. Figuren bei R. Garnier, ihrem Inhalt nach untersucht u. in den römischen Tragödien mit der lateinischen Vorlage verglichen. Inaug. Diss. Kiel, 1886.
- ROLL, O. Ueber den Einfluss der Volksetymologie auf die Entwicklung der neufranzösischen Schriftsprache. Ein Beitrag zur Kenntniss der Sprachgeschichte. Inaug. Diss. Kiel, 1888.
- RUCKOLDT, A. Richelieus Stellung in der Geschichte der französischen Litteratur. Eine Litterarische u. grammatische Untersuchung. Inaug. Diss. Jena, 1889.
- SCHOPF, S. Beiträge zur Biographie u. zur Chronologie der Lieder des Troubadours Peire Vidal. Inaug. Diss. Kiel, 1887.

- THOMSEN, E. Über die Bedeutungsentwicklung der Scheidewörter des Französischen. Inaug. Diss. Kiel, 1890.
- WILLIAMS, C. A. Die Französischen Ortsnamen Keltischer Abkunft. Inaug. Diss. Strassburg, 1891.
- WOLFF, E. Zur Syntax des Verbs bei Adenet Le Roi. Inaug. Diss. Kiel, 1884.

LANGUAGE AND LITERATURE (TEUTONIC).

NON-SERIALS.

Pamphlets, 30d.

- AHLGRIMM, T. Untersuchungen über die Gothaer Handschrift des "Herzog Ernst." Inaug. Diss. Kiel, 1890.
- BALG, G. H. The First Germanic Bible, translated from the Greek by the Gothic Bishop Wulfila in the fourth century, and the other remains of the Gothic Language. Milwaukee, New York, London and Halle, 1891. 26a
- (Translator) Gothic Grammar with Selections for Reading and a Glossary, by Wilhelm Braune. Translated from the Second German edition by G. H. Balg. New York, 1883. 26a
- A Comparative Glossary of the Gothic Language with Especial Reference to English and German, with a preface by Prof. F. A. March, LL.D. Mayville, New York, London and Halle, 1887-1889. 26a
- CALAMINUS, W. Zur Kritik u. Erklärung der altnordischen Frithjofssage. Inaug. Diss. Jena, 1887.
- GARKE, H. Prothese u. Aphaerese des H in Althochdeutschen. Inaug. Diss. Strassburg, 1891.
- HEITMULLER, F. Hamburgische Dramatiker zur Zeit Gottscheds u. ihre Beziehungen zu ihm. Ein Beitrag zur Geschichte des Theaters u. Dramas im 18ten Jahrhundert. Inaug. Diss. Jena, 1890.

- GOLDBECK-LOEWE, A. Geschichte der freien Verse in der Deutschen Dichtung. Von Klopstock bis Goethe. Inaug. Diss. Kiel, 1891.
- GRAF, H. Der "Sprachverderber" vom Jahre 1643 u. die aus ihm hervorgegangenen Schriften. Inaug. Diss. Jena, 1892.
- HELLQUIST, E. Bidrag till laran om den Nordska Nominalbildningen. Publication Upsala, 1890.
- KUHMANN, H. Die Konzessivsätze in Nibelungenliede u. in der Gudrun mit Vergleichung der ubrigen mittelhochdeutschen Volksepen. Inaug. Diss. Kiel, 1891.
- LITZMANN, A. Untersuchungen über Berthold von Holle. Habilitationsschrift. Jena, 1891.
- MENSING, O. Untersuchungen über die Syntax der Concessivsätze im Alt- und Mittelhochdeutschen mit besonderer Rücksicht auf Wolframs Parzival. Inaug. Diss. Kiel, 1891.
- NETOLICZKE, O. Schaferdichtung u. Poetik im 18ten Jahrhundert. Inaug. Diss. Jena, 1889.
- PULS, A. Untersuchung über die Lautlere der Lieder Muscatblut's. Inaug. Diss. Kiel, 1881.
-
- RADKE, G. Die epische Formel in Nibelungenliede. Inaug. Diss. Kiel, 1890.
- RODE, A. Über die Margaretenlegende des Hartwig von dem Hage. Inaug. Diss. Kiel, 1890.
- ROSENHAGEN, G. Untersuchungen über Daniel vom Bluhenden Tal v. Stricker. Inaug. Diss. Kiel, 1890.
- SCHULTZ, F. Die Überlieferung der mittelhochdeutschen Dichtung "Mai und Beaflo." Inaug. Diss. Kiel, 1890.
- SCHUTZE, K. Die Lieder Heinrichs von Morungen auf ihre Echtheit geprüft. Inaug. Diss. Kiel, 1890.
- SCHUTZE, P. Beiträge zur Poetik Otfrids. Habilitationsschrift. Kiel, 1887.

- SOKOLOWSKY, R. Das Aufleben des altdeutschen Minnesangs in der neueren deutschen Litteratur (First chapter). Inaug. Diss. Jena, 1891.
- SUTTERLIN, A. Laut-u. Flexionslehre der Strassburger Mundart in Arnold's Pfingstmontag. Inaug. Diss. Strassburg, 1891.
- TORP, A. Beiträge zur Lehre von den geschlechtlosen Pronomen in den indogermanischen Sprachen. Christiania, 1888.
- WEEDE, E. Die Wahrheit eine Reimpredigt aus dem 11ten Jahrhundert. Inaug. Diss. Kiel, 1891.
- WACHTER, O. Untersuchungen über das Gedicht "Mai u. Beafloer." Inaug. Diss. Jena, 1889.

LANGUAGE AND LITERATURE, (ORIENTAL.)

NON-SERIALS.

Pamphlets, 30d.

- AHFELDT, O. C. P. Den Jeremianska Profetiam om Guds Rike. Publications Upsala, 1891.
- BUGGE, S. Beiträge zur etymologischen Erläuterung der armenischen Sprache. Christiania, 1889.
- BOUK, H. De Davide, Israelatarum Rege. Inaug. Diss. Kiel. 1891.
- FEILCHENFELD, JOSEF. Ein einleitender Beitrag zum *garib-alkuram* nebst einer Probe aus dem Lexikon des Segestani. Inaug. Diss. Jena.
- FEIGE, H. Die Geschichte des *Mar Abhdiso* und seines Jungers *Mar Quardagh*. Inaug. Diss. Kiel, 1889.
- FICK, R. Eine jainistische Bearbeitung der Sagara Sage. Inaug. Diss. Kiel, 1888.

- FRIES, K. *Weddase Marjam* ein Aethiopischer Lobgesang an Maria nach mehreren Handschriften herausgegeben und Ubersetzt. Inaug. Diss. Upsala, 1892.
- HUIZINGA, A. H. *Analogy in the Semitic Languages.* Diss. Johns Hopkins, 1891.
- OPPENHEIM, B. *Die Syrische Uebersetzung des funften Buches der Psalmen.* Inaug. Diss. Konigsberg, 1891.
- SELER, E. *Das Conjugationssystem der Maya-sprachen.* Leipzig, 1887.
- THIESEN, J. H. *Die Legende von Kisagotami.* (Erster Theil.) Inaug. Diss. Kiel.
- WEILL, E. *Der Commentar des Maimonides zum Tractat Berachoth.* Inaug. Diss. Strassburg, 1891.

MATHEMATICS.

NON-SERIALS.

Pamphlets, 21a.

- BACKLIN, G. *Om partiela Differentialequationer af ordningen u. med en beroende och tua obervende variabler.* Upsala, 1890.
- BALL, R. S. *The Eighth Memoir on the Theory of Screws, Showing how Plane Geometry Illustrates General Problems in the Dynamics of a Rigid Body with three Degrees of Freedom.* Trans. of Royal Irish Academy, vol. XXIX, No. 8, pp. 247-284.
- *Certain Problems in the Dynamics of a Rigid System Moving in Elliptic Space.* Ibid., vol. XXVIII, No. 9, pp. 159-184.
- *Extension of the Theory of Screws to the Dynamics of any Material System.* Ibid., vol. XXVIII, No. 7, pp. 99-136.

- CHAPMAN, C. H. Theory of Equations. New York, 1892.
- DIESING, H. Ueber eine gewisse Cremona'sche Verwandtschaft vierter Ordnung u. eine neue. lineare Construction der Oberflächen zweiten Grads aus 9 Punkten. Inaug. Diss. Jena, 1887.
- FLINT, A. S. On the Probable Value of the Latitude and its Theoretical Weight from Entangled Observations Occurring in the use of Talcott's Method. Washington, D. C., 1887. 20b.
- GUNTSCH, R. Zur Integration der Differentialgleichung $\frac{dy}{dx} = p_0 + p_1 y + p_2 y^2 + p_3 y^3$. Inaug. Diss. Jena. 1891.
- HALM, J. Ueber zwei homogene lineare Differentialgleichungen m. n^{ter} Ordnung mit m+n-1 resp. n endlichen singularen Punkten. Inaug. Diss. Kiel, 1890.
- HIRN, G. A. Notice sur les Lois du Frottement. Paris, 1884.
- HIRSCH, A. Zur Theorie der linear Differentialgleichung mit rationalem Integral. Inaug. Diss. Königsberg, 1892.
- HUGO, C. L. La Theorie Hugodecimale ou la Base Scientifique et Definitive de l'arithmologistique Universelle. Paris, 1877.
- La Question de l'equidomoide et des cristalloides geometriques. Paris, 1875.
- JBRUGGER, C. Ueber die Anziehung eines homogenen schiefen Kreiscylinders. Inaug. Diss. Jena, 1886.
- KARSTEN, B. Ueber die Lage des neutralen Punktes in einem Inductionskreise. Inaug. Diss. Kiel. 1889.
- KOCH, H. Sur les determinantes Infinis et les equations differentielles lineaires. These pour le Doctorat. Upsala, 1892.
- LANDERO, C. F. and PRIETO, R. Dinamica Quimica. Guadalajara, 1886.

- LIE, S. Om Poncelets Betydning for Geometrien. Christiania, 1878.
- Classification der Flächen nach der Transformationsgruppe ihrer geodatischen Curven. Christiania, 1879.
- Zur Theorie der Transformationsgruppen. Christiania, 1888.
- Ein Fundamentalsatz in der Theorie der unendlichen Gruppen. Christiania, 1889.
- MICHAELSON, A. Der logarithmische Grenzfall der Hypergeometrischen Differentialgleichung n-Ordnung. Inaug. Diss. Kiel, 1889.
- OELTJEN, H. Die Differentialgleichungen für das Gleichgewicht der isotropen elastischen Platten. Inaug. Diss. Kiel, 1881.
- OLSSON, O. Om fasta Kroppars rörelse i vatskor. Upsala, 1890.
- OPPENHEIMER, H. Anwendungen des Amesederschen Nullsystems. Inaug. Diss. Jena, 1881.
- PETRINI, H. Om de till ekvationen $\Delta\varphi = \theta$ hörande ortogonala Koordinatsystem. Upsala, 1890.
- PENSELER, G. Eine Linear Differentialgleichung fünfter Ordnung mit zwei endlichen singularen Stellen. Inaug. Diss. Kiel, 1890.
- PENZOLD, Eduard. Bestimmung der Lichtmenge, welche ein Ellipsoid von einem leuchtenden Punkte empfängt, wenn es teilweise von einem andern Ellipsoid beschattet wird. Inaug. Diss. Jena.
- RUHLMANN, R. Philosophische Arbeit ueber die Zahl. Inaug. Diss. Kiel, 1889.
- SACK, P. Ueber Kreisbündel 11ter Ordnung. Inaug. Diss. Jena, 1890.

- SCHLESINGER, L. Ein Beitrag zur Theorie der linearer homogenen Differentialgleichungen dritter Ordnung. Inaug. Diss. Kiel, 1888.
- STRAUBEL, RUDOLPH, Ueber die Berechnung der Fraunhofer'schen Beugungserscheinungen durch Randintegrale mit besonderer Berücksichtigung der Theorie der Beugung im Heliometer. Inaug. Diss. Jena, 1888.
- TARLETON, F. A. On some Deductions from M'Cullagh's Lectures on Rotation. Trans. of the Royal Irish Academy, vol. XXVIII, No. 10, pp. 185-196.
- THUE, A. To theoremer vedrorende en Klasse brakistokrome Kurver. Christiania, 1888.
- TUCH, T. Eine Cremona'sche Punkt-Gerade-Verwandtschaft zweiter Ordnung nebst einer Untersuchung über die einer Curve dritter Ordnung gleichzeitig ein- u. umgeschriebenen Dreiecke. Inaug. Diss. Jena, 1890.
- VELDE, W. Ueber einen Spezialfall der Bewegung eines Punktes welcher von festen Centren ausgezogen wird. Inaug. Diss. Kiel, 1889.
- WATSON, Wm. Course in Shades and Shadows. Boston, 1885. 20b.
- WEINNOLDT, E. Über Functionen, welche gewissen Differentialgleichung u. Ordnung Genüge leisten. Inaug. Diss. Kiel, 1885.

MEDICINE.

SERIALS.

- BERLIN [Germany] Kaiserliche Gesundheitsamte.
Arbeiten. Vol. VI, Heft 3, 1890 + 29d
- GRAZ [Styria] Verein der Arzte in Steiermark.
Mitth., Vol. XXVI, (1889) + 29d

- JENA** [Germany] Medizinisch- Naturwissenschaftliche Gesellschaft.
Zeitschr. Vol. X. (Neue Folge Vol. III). + 6e
- CHICAGO** [Ill.] U. S. Medical Investigator.
Semi-Monthly Journal, 1873, 74, 75, 76, Nos. 1-3,
5, 7, 8. 29d
- HEIDELBERG** [Germany] Naturhistorisch-Medizinischer Verein.
Festschrift z. Feier des funfhundertjahrigen
Bestehens der Ruperto Carola. 6e
Verhandlungen. Vols. I, (pp. 229-444 wanting), II, pp. 471-312; III, pts. 1-5, IV,
pts. 1-5. 6e
- CHICAGO** [Ill.] Northwestern University.
.N. W. Surgical Journal, 1871-72. 29d

NON-SERIALS.

Pamphlets, 29 c and d.

- ACKERMANN, G.** Ueber die Entwicklung von Wahneideen aus Hallucinatorischen Vorgangen. Inaug. Diss. Jena, 1891.
- ALBERT, H.** Ein Fall v. Tuberkulose des Herzens. Inaug. Diss. Kiel, 1883.
- ALVARENGA, P. F. de C.** Lecons Cliniques sur les Maladies du coeur. Translated from Portuguese by Dr. E. Bertherand. Lisbon, 1878. 29d.
- ALVARENGA, P. D.** Precis de Thermometric Clinique Generale, Lisbon, 1871.
- AMMON, J.** Beitrag zur Statistik der Thranensack-Extirpationen. Inaug. Diss. Kiel. 1892.
- APFELSTEDT, CARL.** Beitrag zur Kasuistik der Missbildungen des ausseren Ohres. Inaug. Diss. Jena.
- APPEL, J.** Ueber epidemische Cerebrospinalmeningitis. Inaug. Diss. Kiel, 1884.

- ASKANAZY, S. Ueber die Regeneration glatter Muskelfasern. Inaug. Diss. Königsberg, 1891.
- AUST, C. Beitrag zur Behandlung der Empyeme mittels der Bulau'schen Aspirations-Drainage. Inaug. Diss. Kiel, 1892.
- BAEHR, A. Ueber die Behandlung acuter Krankheiten der Haut u. unter ihr liegender Gewebe mit Thiol. Inaug. Diss. Kiel, 1891.
- BANDISCH, R. 80 Fälle v. Ovariectomie aus der gynäkologischen Universitäts-Klinik zu Königsberg. Inaug. Diss. Königsberg, 1892.
- BARBROCK, W. Ueber Pseudoleukämie mit recurrierendem Fieberverlauf. Inaug. Diss. Kiel, 1890.
- BARCKMANN, C. Ueber Xeroderma pigmentosum. Inaug. Diss. Kiel, 1888.
- BARGUM, J. Ein Fall von Actinomykosis hominis. Inaug. Diss. Kiel, 1884.
- BARNUM, W. Ueber Atresie der Vagina und des Uterus. Inaug. Diss. Jena, 1891.
- BARTIKOWSKI, E. Ueber Verletzungen der Kniebandscheiben. Inaug. Diss. Jena, 1892.
- BARTSCHER, L. Ein seltener Fall v. beiderseitigem Nierendefect neben anderen Missbildungen. Inaug. Diss. Kiel, 1890.
- BAYER, MAX. Ueber einen Fall von cerebraler Kinderlähmung. Inaug. Diss. Jena.
- BECKER, A. Zwei geheilte Fälle v. Derm-Invagination. Inaug. Diss. Kiel, 1890.
- BECKER, E. Ueber Dextrocardie. Inaug. Diss. Jena, 1891.
- BECKER, E. F. Zur Ätiologie der Darmscheidungen. Inaug. Diss. Kiel, 1885.

- BECKER, H. Die Herniotomien der Kieler Klinik. Inaug. Diss. Kiel, 1880.
- BECKMANN, H. Ein Beitrag zur Statistik und Therapie der Malaria in Kiel. Inaug. Diss. Kiel, 1891.
- BEHRENDSEN, G. Die Esmarck'sche Methode der Hasenschartenoperation. Inaug. Diss. Kiel, 1883.
- BEHRENS, T. Ueber Fremdkörper in den Luftwegen. Inaug. Diss. Kiel, 1887.
- BELOW, A. Ueber Hernia propperitonealis. Inaug. Diss. Kiel, 1890.
- BENTHIN, O. Ueber Resection des Fussgelenk. Inaug. Diss. Kiel, 1880.
- BERENT, A. Ueber die Heilung von Herzwunden mit besonderer Berücksichtigung der Grawitz'schen Schlummerzellentheorie nach Versuchen am Kaninchen. Inaug. Diss. Kiel, 1892.
- BERGER, G. Fünf Fälle v. Erweiterung der Stirnhohlen durch Flüssigkeitsansammlung. Inaug. Diss. Kiel, 1887.
- BERLIN, W. Ueber einen Fall v. Atelektalischer Bronchiektasie. Inaug. Diss. Kiel, 1891.
- BERNSTORFF, E. Ein eigenthümlicher Fall v. hernienartiger Verwölbung des Zwerchfelles. Inaug. Diss. Kiel, 1891.
- BERTHEAN, H. Zur Lehre v. der Inhalationstuberkulose. Inaug. Diss. Kiel, 1880.
- BIER, A. Beiträge zur Kenntniss der Sypholome der ausseren Muskelatur. Inaug. Diss. Kiel, 1888.
- Ueber Circulare Darmnaht. Inaug. Diss. Kiel, 1889.
- BIDDER, F. Ein Fall von *Inversio vesicæ urinariæ congenita*. Inaug. Diss. Königsberg, 1891.

- BIERFREUND, M.** Ueber das Verhalten des Endometriums bei Carcinoma portionis et cervicis uteri. Inaug. Diss. Königsberg, 1891.
- BORN, WALTER.** Beitrag zur Lehre von den Psychosen des Kindesalters. Inaug. Diss. Jena.
- BRAUS, HERMANN.** Ueber die Rami ventrales der vorderen Spinalnerven einiger Selachier. Inaug. Diss. Jena.
- BLIEDTNER, E.** Beitrag zur Kenntniss der Wirkung des Lobelin. Inaug. Diss. Kiel, 1891.
- BOCK, A.** Untersuchungen über die Erbllichkeit der Myopie. Inaug. Diss. Kiel, 1892.
- BOCK, G.** Beitrag zur Kenntniss der Wirkung des Digitalein. Inaug. Diss. Kiel, 1892.
- BOCKENDAHL, A.** Ueber die Bewegung des m. tensor tympani nach Beobachtungen beim Hunde. Inaug. Diss. Kiel, 1880.
- BOGERSHAUSEN, H.** Ueber Ektropium-Operationen. Inaug. Diss. Kiel, 1890.
- BOIE, C.** Ein Beitrag zur Keratitis parenchymatosa aus den Journalen der Universitäts-Augenklinik zu Kiel. Inaug. Diss. Kiel, 1887.
- BOKELMANN, H.** Zwei Fälle von Axendrehung des Dickdarms. Inaug. Diss. Kiel, 1889.
- BOLCK, W.** Die Alkoholbehandlung bei Erkrankungen des Ohres. Inaug. Diss. Königsberg, 1892.
- BOLTE, H.** Beitrag zur Ätiologie u. operativen Behandlung der Haematocele retrouterina. Inaug. Diss. Kiel, 1889.
- BOLTZ, R.** Ein Beitrag zur Statistik u. Anatomie der Tuberkulose im Kindersalter. Inaug. Diss. Kiel, 1890.
- BORDING, B.** Das Meckel'sche Divertikel als Ursache innere Darmeinklemmung. Inaug. Diss. Kiel, 1891.

- BORK, G. Ueber die Missbildungen bei Tarnien. Inaug. Diss. Kiel, 1891.
- BOSDORFF, E. Ueber Haufigkeit u. Vorkommen der Anenrysmen. Inaug. Diss. Kiel, 1889.
- BOTJER, W. Die Antisepsis in der Geburtshulfe. Inaug. Diss. Kiel, 1880.
- BRANDIS, J. Ein Fall v. Dickdarmsyphilis. Inaug. Diss. Kiel, 1884.
- BRATZ, E. Ueber Strychnin u. Brucin. Inaug. Diss. Kiel, 1891.
- BREEDER, H. Ein Fall von todtlicher Blutung aus Magenvaricen. Inaug. Diss. Kiel, 1887.
- BREESE, G. Ein Beitrag zur Statistik und pathol. Anatomie der Hirnblutung. Inaug. Diss. Kiel, 1888.
- BREMEN, O. Befund bei einem Fall v. chronischen univerr-sellen Ekzem. Inaug. Diss. Kiel, 1891.
- BRENING, J. Bacteriologische Untersuchung des Trinkwassers der Stadt Kiel. Inaug. Diss. Kiel, 1888.
- BRUHN, C. Ein Fall v. Verletzung des Schnerven Blutung in die Orbita u. Opticusscheide u. directer Zerreiſsung der Choridea. Inaug. Diss. Kiel, 1889.
- BRUHN, T. Beitrag zur Statistik der Extirpation tuberculoser Lymfdrusentumoren. Inaug. Diss. Kiel, 1887.
- BRIMING, K. Ueber Morphin u. Codein. Inaug. Diss. Kiel, 1891.
- BUCHMANN, J. Ueber die diuretische Wirkung der Salicylsaure und Benzoensaure. Inaug. Diss. Kiel, 1892.
- BUCK, R. Ein Interessanter Fall von Schnurwirkungen an den Baucheingeweiden. Inaug. Diss. Kiel, 1889.
- BULUHEIM, K. Ein Fall v. Echinococcus-Embolie der Hirnarterien. Inaug. Diss. Kiel, 1890.

- BÜLTMANN, W. Ein Beitrag zum Erfolge der Iridectomie bei Glaucoma simplex. Inaug. Diss. Kiel, 1880.
- BURMEISTER, J. Einige Fälle v. Miliartuberkulose ausgehend v. cariösen Processen. Inaug. Diss. Kiel, 1889.
- BURMEISTER, R. Ueber die Wirkung des Coniin auf den Kreislauf. Inaug. Diss. Kiel, 1881.
- BUTEFISCH, H. Ueber Encephalopathia Saturnina. Inaug. Diss. Kiel, 1891.
- CARSTENS, C. Beitrag zur Lehre u. Statistik der Oesofagusgeschwüre. Inaug. Diss. Kiel, 1889.
- CASPERSON, C. Zur Statistik u. Radikaloperation des Mastdarmkrebus. Inaug. Diss. Kiel, 1887.
- CLAUSSEN, J. A. Die Wirkungen des Hyoscium Hydrojodicum u. Hydrobromicum in Vergleiche mit denen des Atrapin u. des Extr. Hyoscyami. Inaug. Diss. Kiel, 1883.
- COESFELD, H. Ueber Fliunnerepithelcysten des Oesophagus. Inaug. Diss. Kiel, 1891.
- COHN, S. Beitrag zur Statistik des runden Magengeschwurs. Inaug. Diss. Kiel, 1891.
- COHN, T. 31 Fälle v. Myomektomie. Inaug. Diss. Königsberg, 1891.
- COLLISCHONN, H. Beitrag zur Casuistik der Form u. Lagerungsstörungen des Magens. Inaug. Diss. Kiel, 1888.
- CRAMER, E. Zur Behandlung der Endometritis Hyperplastica mit Chlorzinkstiften. Inaug. Diss. Kiel, 1892.
- CROMME, F. Beitrag zur Kenntniss der Wirkung des Nitroprussidnatrium. Inaug. Diss. Kiel, 1891.
- CUNNINGHAM, D. J. The Brain and Eyeball of a Human Cyclopiian Monster. Trans. of Royal Irish Acad., vol. XXIX, No. 4, pp. 101-122; pl. 5.

- DANIELSON, H. Krebs-Statistik nach den Befunden des Pathologischen Instituts zu Kiel von Jahre 1873-1887. Inaug. Diss. Kiel, 1887.
- DANNEMANN, A. Beitrag zur Kenntniss der Wirkung des Physostigmin. Inaug. Diss. Kiel, 1891.
- DEMOHN, G. Ueber einen Fall v. grossem Darmstein. Inaug. Diss. Kiel, 1891.
- DENKER, A. Ein Beitrag zur Lehre v. der Resorptionsthatigkeit der Magenschleimhaut. Inaug. Diss. Kiel, 1890.
- DERBE, M. Ueber das Vorkommen von Pflasterepithel in Cylinderepitheltragenden Schleimhäuten. Inaug. Diss. Königsberg, 1892.
- DITTMER, J. Beitrag zur Statistik der modificierten Linear-Extraktion. Inaug. Diss. Kiel, 1892.
- DOEGE, M. Ein Fall v. Nierenextirpation nach subcutaner Verletzung der Niere. Inaug. Diss. Kiel, 1889.
- DOEHLE, P. Beobachtungen über einen Antagonisten des Milzbrandes. Inaug. Diss. Kiel, 1889.
- Ein Fall v. Eigenthümlicher Aortenerkrankung bei einem Syphilitischen. Inaug. Diss. Kiel, 1885.
- DONHOFF, R. Beitrag zur Statistik u. Pathologischen Histologie der Tubenerkrankungen. Inaug. Diss. Kiel, 1888.
- DORKEN, E. Ein Fall von Spontaner Milzruptur. Inaug. Diss. Kiel, 1892.
- DOSE, C. Beitrag zur Kenntniss der Wirkung des Landanins. Inaug. Diss. Kiel, 1890.
- DRESSLER, O. Ein Beitrag zur Beurtheilung der Alexander-Adam'schen Operation. Inaug. Diss. Kiel, 1890.
- DREYER, A. Beitrag zur Kenntniss der Funktion der Schutzscheide. Inaug. Diss. Jena, 1892.

- DUVELINS, J. Ueber Entzündungen der bursa trochanterica u. deren Behandlung. Inaug. Diss, Kiel, 1880.
- EICHHORN, HUGO, Beiträge zur Kenntniss des Einflusses von Temperatur und Witterungs-verhältnissen auf die Tenacital des tuberkulösen Sputums. Jena, 1893.
- ERLER, K. H. Zur Kenntniss der Nereiditar luetischen Zungen-Speicheldrüsen- und Halslymphdrüsen-Vergrosserung. Inaug. Diss. Jena, 1892.
- ERNST, G. Bericht über 25 von Herrn Professor Dr. Riedel operierte Fälle von Kropfgeschwulsten. Inaug. Diss. Jena, 1892.
- ESCHRICHT, C. Ein Fall v. Hydrops genuintermittens. Inaug. Diss. Kiel, 1888.
- EBERMAIER, A. Ein Fall v. Syphilis hereditaria tarda. Inaug. Diss. Kiel, 1888.
- ELGEHAUSEN, F. Ein seltene Misbildung des weiblichen Urogenitalapparates. Inaug. Diss. Kiel, 1891.
- ENGEL, H. Ein Fall v. Myxoma lipomatodes der Unterleibshöhle. Inaug. Diss. Kiel, 1888.
- FALCK, H. Beitrag zur Lehre u. Casnistik der Bindegeweschswulste des Halses. - Inaug. Diss. Kiel, 1887.
- FENSTELL, F. Ueber die späteren Schicksale der Atelektase. Inaug. Diss. Kiel, 1883.
- FICHTEL, J. Die Befunde bei plotzlichen Todesfällen im pathologischen Institut zu Kiel. Inaug. Diss. Kiel, 1888.
- FISCHER, B. Ueber einen Lichtentwickelnden im Meerwasser gefundenen Spaltpilz. Inaug. Diss. Kiel, 1887.
- FISCHER-BENZON, L. Ein Beitrag zur Anatomie u. Ätiologie der beweglichen Niere. Inaug. Diss. Kiel, 1887.
- FISCHER, C. Einige Fälle v. heteroplastischen Osteomen. Inaug. Diss. Kiel, 1888.

- FISCHER, H. Beitrag zur Casuistik der Akromegalie und Syringomyelie. Inaug. Diss. Kiel, 1891.
- FISCHER, K. Beitrag zur Kenntniss der Wirkung des Pilocarpin. Inaug. Diss. Kiel, 1891.
- FISCHER, W. Ueber die feineren Veränderungen bei der Bronchitis u. Bronchiektasie. Inaug. Diss. Kiel, 1889.
- FLACK, J. Ueber Sarkome der Augenlider. Inaug. Diss. Königsberg, 1892.
- FONSECA, M. W. de. Beitrag zur Frage der nachtllichen Harnabsonderung u. zur Physiologie der Harnaussammlung in der Blase. Inaug. Diss. Kiel, 1888.
- FRANKE, K. Ueber Senkung und Vorfall der Gebärmutter während der Schwangerschaft u. Geburt. Inaug. Diss. Jena, 1892.
- FRANTZ, O. Ein Fall v. Herniadiafragmalica congenita. Inaug. Diss. Kiel, 1891.
- FRANZEN, A. Ueber Lenkaemie und perniciose Anaemie. Inaug. Diss. Kiel, 1892.
- FRERS, A. Ein Beitrag zum Erfolg der Iridektomie bei glaucoma simplex. Inaug. Diss. Kiel, 1890.
- FRICKE, A. Ein interessanter Fall von Schnurwirkungen. Inaug. Diss. Kiel, 1892.
- FRIEDE, H. Zur Ätiologie der Polypen an der Conjunctiva. Inaug. Diss. Kiel, 1885.
- FRIEDEMANN, J. H. Pathologisch-anatomische Befunde bei Selbstmördern. Inaug. Diss. Kiel, 1890.
- FRIEDLANDER, S. Ueber Phosphorvergiftung bei Hochschwangeren. Inaug. Diss. Königsberg, 1892.
- FRIEDERICHS, E. Beitrag zur Kenntniss der Wirkung des Veratrin. Inaug. Diss. Kiel, 1891.

- FUNCK, G. Zur Kenntniss der syphilitischen Erkrankung der Knochen, speciell des Beckens. Inaug. Diss. Jena, 1892.
- FRIEDRICH, M. Ueber metastatische proliferirende Papillome der Aortenwand bei primären proliferirenden papillären Kystomen des Ovarium. Inaug. Diss. Kiel, 1888.
- FRITZ, R. Ueber die Resektion des Ellenbogengelenks. Inaug. Diss. Kiel, 1880.
- FURER, C. Einige Fälle v. metastasirenden Schilddrüsen-Geschwulsten. Inaug. Diss. Kiel, 1889.
- GALLUS, KURT. Die akute hallucinatorische Paranoia im Greisenalter. Inaug. Diss. Jena.
- GARTENMEISTER, M. Ueber einseitige Amblyopie nach Schreck. Inaug. Diss. Königsberg, 1891.
- GEERDTS, L. Ein Fall v. doppelter Ureteren-Bildung mit blinder Endigung des einen derselben. Inaug. Diss. Kiel, 1887.
- GEHL, O. Ein Fall v. Verletzung des Sehnerven. Inaug. Diss. Kiel, 1888.
- GERLING, K. Ueber Athetosis. Inaug. Diss. Kiel, 1887.
- GERLOFF, O. Beitrag zum Strychnin-Diabetes. Inaug. Diss. Kiel, 1888.
- GIESE, J. Ueber den ophthalmoscopischen Befund bei Myopie. Inaug. Diss. Kiel, 1891.
- GLÆRECKE, L. Körperliche u. geistige Veränderung im weiblichen Körper nach künstliche Verlusten der Ovarien einerseits u. des Uterus andererseits. Inaug. Diss. Kiel, 1891.
- GLUM, F. Beitrag zur Kenntniss der Einwirkung des Schlafes auf die Harnabsonderung. Inaug. Diss. Kiel, 1889.
- GLAWATZ, E. Beitrag zur Kenntniss der Wirkung des Erythrophlein. Inaug. Diss. Kiel, 1891.

- GOETZ, E. Das Homatropin in der Augenheilkunde. Inaug. Diss. Kiel, 1881.
- GORGES, H. Beitrag zur pathologischen Anatomie der Difterie. Inaug. Diss. Kiel, 1888.
- GOTTBERG, A. Beitrag zur Ätiology und Bathogenese der exfoliirenden Necrose der innern Blasenschichten. Inaug. Diss. Kiel, 1892.
- GOTTBERG, M. Beitrag zur Behandlung tramnat.-Gehirnabscesse. Inaug. Diss. Kiel, 1890.
- GOTZE, R. Diffusion v. Wasserdampfen in Gasgemische. Inaug. Diss. Jena, 1892.
- GREEFF, E. Ueber drei Falle von Missbildung durch amniotische Strange. Inaug. Diss. Kiel, 1892.
- GRIMM, C. Ueber Thebain u. Landanin. Inaug. Diss. Kiel, 1891.
- GROSSE, U. Ueber Keratohyalin u. Eleidin u. ihre Beziehung zum Verhornungsprocesse. Inaug. Diss. Königsberg, 1882.
- GROTE, G. Ueber die Glandulæ anales des Kaninchens. Inaug. Diss. Königsberg, 1891.
- GROTE, H. Ein Fall v. angeborener Ektasie Hypertorfië der Harnblase u. der pars prostatica urethræ. Inaug. Diss. Kiel, 1891.
- GRUBE, O. Ueber Bursitis trochanterica. Inaug. Diss. Kiel, 1889.
- GUNTHER, E. Stieltorsion eines mit Sarcombildung complicirten Uterusfibroms Aocites, Heilung mittelst Laparotomie. Inaug. Diss. Jena, 1892.
- GUTTMANN, P. Erfahrungen über das Pyoctanin in der chirurgischen Praxis. Inaug. Diss. Kiel, 1890.

- HAACKE, E. Ein Beitrag zur pathologischen Histologie des Magens. Inaug. Diss. Kiel, 1887.
- HAABS, G. Beitrag zur Lehre v. der diffusen congenitalen Lebersyphilis. Inaug. Diss. Keil, 1891.
- HADENFELDT, H. Ueber Arthrodesis besonders bei den Folgen der spinalen Kinderlahmung. Inaug. Diss. Kiel, 1889.
- HAHN, J. Ueber Transplantation ungestielter Hautlappen nach Wolfe, mit Berücksichtigung der ubrigen Methoden. Inaug. Diss. Kiel, 1888.
- HAHN, RUDOLF. Ueber Folgen und Operationen alter Schussverletzungen. Inaug. Diss. Jena.
- HALLERSTEIN, S. F. H. v. Drei Falle v. Luftdrucklahmung. Inaug. Diss. Kiel, 1889.
- HAMANN, H. Statisk der Tuberkulose. Inaug. Diss. Kiel, 1890.
- HANSEN, J. A. Ein Beitrag zur Persistenz des Ductus omphalo-entericus. Inaug. Diss. Kiel, 1885.
- HANSEN, W. Uutersuchungen uber die Refractionsverhaltnisse im 10-15 Lebensjahre u. das. Wachsthum der Augen in diesen Jahren. Inaug. Diss. Kiel, 1884.
- HANSSEN, R. Die Augenklinik zu Kiel. Inaug. Diss. Kiel, 1889.
- HARDING, W. Ein Beitrag zur Kenntniss der congenitalen Halsfisteln. Inaug. Diss. Kiel, 1890.
- HARKE, T. Ein Fall v. dreimaliger Magenresection wegen Magenbauchwandfistel. Inaug. Diss., Kiel, 1887.
- HARS, C. Beitrage zur Lehre v. der Arthritis gonorrhoeica. Inaug. Diss. Kiel, 1887.
- HARTMANN, A. Beitrag zur Lehre v. der Aphasie. Inaug. Diss. Kiel, 1889.

- HARTMANN, R. Beitrag zur Statistik der Pachymeningitis Haemorrhagica. Inaug. Diss. Kiel, 1889.
- HARTMANN, W. Beitrag zur Kenntniss der epibulbaren Carcinome. Inaug. Diss. Kiel, 1892.
- HARTTUNG, O. Ueber epidemische Cerebrospinalmeningitis in Kiel. Inaug. Diss. Kiel, 1888.
- HECKELMANN, G. Ein Fall von Nieren Geschwulst bei einem jungen Kind. Inaug. Diss. Kiel, 1891.
- HEGAR, A. Die Tuberkulose der Schilddrüse. Inaug. Diss. Kiel, 1891.
- HEILBRUNN, K. Ein Beitrag zur Histologie der Milz. Inaug. Diss. Kiel, 1890.
- HEIN, M. Ueber einen Fall v. spontaner Herzruptur. Inaug. Diss. Königsberg, 1892.
- HEINEMANN, K. Beitrag zur Lehre vom Ileus. Inaug. Diss. Kiel, 1891.
- HELLER, Josef. Ueber Kaltwasserbehandlung des Typhus. Inaug. Diss. Jena.
- HENNINGS, P. Zur Statistik u. Ätiologie der amyloiden Entartung. Inaug. Diss. Kiel, 1881.
- HENNINGSSEN, H. Beitrag zur Statistik der Fettgeschwulste. Inaug. Diss. Kiel, 1888.
- HENRICHSEN, H. Beitrag zur Kenntniss v. der Wirkung der Abfuhrmittel. Inaug. Diss. Kiel. 1884.
- HENRICI, C. Ueber Trepanation bei Gehirnabscessen. Inaug. Diss. Kiel, 1880.
- HENSCHEL, A. Versuch einer räumlichen Darstellung complexer ebener Gebilde. Inaug. Diss. Jena. 1892.
- HENSCHKEL, W. Krankhafte Vorgänge an den Kiefern und ihr Zusammenhang mit Anomalieen der Zähne. Inaug. Diss. Jena. 1892.

- HENSELER, M. Zwei Falle v. zahlreichen Divertikeln des Dunndarms. Inaug. Diss. Kiel, 1890.
- HERMANN, F. Ueber Tympania Uteri. Inaug. Diss. Konigsberg, 1892.
- HERMENA U, L. Beitrag zur Kenntniss der akuten Encephalitis. Inaug. Diss. Konigsberg, 1891.
- HERTING, J. Ueber Axendrehungen des Darms bei Ungeborenen. Inaug. Diss. Kiel, 1888.
- HERTZFELD, M. Ein Fall v. Nabelschnurbruch. Inaug. Diss. Kiel, 1892.
- HEYKEN, G. Anatomische Untersuchungen ueber die Muskulatur der breiten Mutterbänder. Inaug. Diss. Kiel, 1890.
- HIRSCHBERG, L. Eine Frucht mit angeborenem Hydrocephalus u. Missbildungen des Gesichts u. aussern Ohres. Inaug. Diss. Konigsberg, 1891.
- HITZEGRAD, F. Welcher Art sind die Enderfolge der Kniegelenkresectionen, seit Einfuhrung der antiseptischen Blutleere. Inaug. Diss. Kiel, 1888.
- HOCHÉ, L. Ein Beitrag zur Lehre v. der Radicaloperation v. Hernien, speciell bei Kindern. Inaug. Diss. Kiel, 1888.
- HOCHHAUS, H. Ein Beitrag zur Kenntniss der Meningitis spinalis chronica. Inaug. Diss. Kiel, 1889.
- v. HOLST, RUDOLPH. Zur Frage ueber die Extraction des nachfolgenden Kopfes mit der Zange. Inaug. Diss. Jena.
- HOLST, R. Zur Frage ueber die Extraction des nachfolgenden Kopfes mit der Zange. Inaug. Diss. Jena, 1891.
- HOLZ, A. Ueber juvenile Hysterie beim mannlichen Geschlechte. Inaug. Diss. Jena 1891.
- HONCK, E. Drei Falle v. allgemeinem totalen Hydrops. Inaug. Diss. Kiel, 1887.

- HOPPE-SEYLER, G. Ueber die Ausscheidung der Aetherschwefelsauren in Urin bei Krankheiten. Inaug. Diss. Kiel, 1887.
- HOTZEN, E. Beitrag zur Lehre v. der Verhornung innerer Epithelien, Inaug. Diss. Kiel, 1890.
- HOVENER, O. Sectionsfunde bei tuberculosen nach Koch'scher Methode Behandlung. Inaug. Diss. Kiel, 1891.
- HULSMANN, A. Drei Falle v. chronischem Hydrocephalus. Inaug. Diss. Kiel, 1889.
- HUSTEDT, G. Ueber Todesursache bei Herzenkrankungen. Inaug. Diss. Kiel, 1892.
- JACOB, J. Ueber simulirte Augenkrankheiten. Inaug. Diss. Kiel, 1888.
- JACOB, P. Ueber Retroversio und Retroflexio uteri gravidi. Inaug. Diss. Jena, 1892.
- JAMISEN, B. Ueber Canthoplastik. Inaug. Diss. Kiel, 1890.
- JENSEN, PAUL. Ueber den Geotropismus niederer Organismen. Inaug. Diss. Jena.
- JESSEN, J. Ueber Papaverin u. Kryptopin. Inaug. Diss. Kiel, 1891.
- JESTER, K. Ein Frucht mit Hirnbruch Bauchbruch und amniotischen Verwachsungen. Inaug. Diss. Königsberg, 1892.
- JOACHIMI, ALFRED. Der gegenwartige Standpunkt der Lehre von der Eclampsie. Inaug. Diss. Jena, 1893.
- JOHANNSEN, I. O. Beitrag zur pathologischen Anatomie u. Histologie des Magengeschwurs. Inaug. Diss. Kiel, 1886.
- JUHL, C. Beitrage zur Casuistik des primären Carcinoms des Corpus uteri. Inaug. Diss. Kiel, 1884.

- JUNGLow, H. Ueber einige Entwicklungsvorgänge bei Reptilien-embryonen. Inaug. Diss. Kiel, 1891.
- KALMUS, G. Ein Beitrag zur Statistik u. pathologischen Anatomie der secundären Magen-Differitis. Inaug. Diss. Kiel, 1888.
- KANENHAWEN, W. Beitrag zur Kenntniss der Wirkung des Spartein. Inaug. Diss. Kiel, 1892.
- KARUTZ, R. Zur Kasuistik der Myomotomie. Inaug. Diss. Kiel, 1891.
- KATTEIN, P. Ueber die Wirkung des Brucin auf den Kreislauf. Inaug. Diss. Kiel, 1891.
- KATZ, J. Ein Fall v. Sarkom des Uterus. Inaug. Diss. Kiel, 1887.
- KAUP, J. Zwei Fälle v. Hernia diafragmatica congenita mit Abtrennung eines Lungentheils. Inaug. Diss. Kiel, 1891.
- KAYSER, O. Ein Beitrag zur Alkoholfrage. Inaug. Diss. Kiel, 1888.
- KECH, T. Beitrag zur Kenntniss der Wirkung der Pikrotoxinin. Inaug. Diss. Kiel, 1891.
- KEIMER, W. Ueber zwei Fälle v. intermittirender Bluterkrankheit. Inaug. Diss. Kiel, 1891.
- KERSTING, H. Die Pachydermia laryngis. Inaug. Diss. Königsberg, 1891.
- KIEFER, F. Tannen als Gegengift. Inaug. Diss. Kiel, 1892.
- KIPPENBERG, F. Beitrag zur Lehre von der angeborenen Lung-enlues. Inaug. Diss. Kiel, 1891.
- KIRCHHOFF, DR. Die Localisation psychischer Störungen. Inaug. Diss. Kiel, 1888.
- KLEIN, F. Einige an Eiweisskörpern der Leber u. andere Organe gemachte Beobachtungen. Inaug. Diss. Kiel, 1891.

- KLINGENBERG, W. Ein Beitrag zur Behandlung trammatischer Gehirnabscesse. Inaug. Diss. Kiel, 1890.
- KUNTH, M. A. Ueber spastische Spinalparalyse u. dementia paralytica. Inaug. Diss. Kiel, 1888.
- KOHLER, L. Die Totalexstirpation des Uterus mittelst Laparotomie (Freundische Operation). Inaug. Diss. Jena, 1892.
- KONIG, W. Die Tuberkulose des Schultergelenks. Inaug. Diss. Jena, 1892.
- Ein Fall v. Pankreas-Mekrose nach Blutung u. Fettnekroser. Inaug. Diss. Kiel, 1889.
- KOPPEN, R. Beitrag zur Ätiologie der Blasendilatation. Inaug. Diss. Kiel, 1891.
- KORN, ALFRED. Ueber Iriszysten und Cilien in der vorderen Augenkammer. Inaug. Diss. Jena.
- KOSEGARTEN, W. Ueber eine kunstliche Gehorsverbesserung bei grossen Trommelfellperforationen. Inaug. Diss. Kiel, 1884.
- KOWALZIG, E. Zur Ätiologie u. Therapie der Encephalocele. Inaug. Diss. Kiel, 1890.
- KRAHN, E. Ueber Zwillingsgeburten. Inaug. Diss. Königsberg, 1891.
- KRANCKE, K. Ueber todtliche Duodenalblutungen bei Neugeborenen. Inaug. Diss. Kiel, 1891.
- KREBS, E. Ein Fall v. reinem Cocainismus. Inaug. Diss. Königsberg, 1892.
- KREY, J. Das Ulcus corneæ rodens. Inaug. Diss. Kiel, 1890.
- KRIEG, M. Ueber Extranterigravidität. Inaug. Diss. Königsberg, 1892.
- KROP, AUGUST. Ueber die Veränderungen der Knochen und Gelenke nach essentieller Kinderlahmung. Inaug. Diss. Jena.

- KRUCKEL, F. Ueber die toxische und Therapeutische Wirkung des Kalium chloricum. Inaug. Diss. Kiel, 1891.
- KRUMBHOLZ, H. Beitrag zur Statistik der Cerebrospinalmeningitis. Inaug. Diss. Kiel, 1892.
- KUHL, J. Ueber tuberculose Magen-Geschwure. Inaug. Diss. Kiel, 1889.
- KUNZE, F. Beitrag zur Lehre der Staubinhalationskrankheiten. Inaug. Diss. Kiel, 1887.
- KURRER, A. Ueber Temperaturerhöhungen bei Heizern. Inaug. Diss. Kiel, 1892.
- KUSTER, G. Beitrag zur Kenntniss der Wirkung des Atropin. Inaug. Diss. Kiel, 1892.
- LACKEMANN, W. Beitrag zur pathologischen Anatomie und Statistik der Myokarditis. Inaug. Diss. Kiel. 1890.
- Ueber maligne Recidive nach Ovariotonien. Inaug. Diss. Kiel, 1890.
- LACROIX, M. Tribut a l'Histoire des Kystes des Ovaires et de leur Traitment. Paris, 1873. 29d.
- LANG, HEINRICH ALFRED. Ueber die Membrana orbitalis der Säugetiere. Inaug. Diss. Jena, 1893.
- LAMMERS, J. Anatomische u. klinische Mitteilungen zur Physiologie der Nachgeburtsperiod. Inaug. Diss. Kiel, 1890.
- LANG, H. Ein Beitrag zur Statistik u. pathologischen Anatomie der interstitiellen Hepatitis. Inaug. Diss. Kiel, 1888.
- LANG, W. Ein Fall v. Lebervenenobliteration. Inaug. Diss. Kiel, 1886.
- LANGNER, O. Ueber Gastrostomie. Inaug. Diss. Kiel. 1884.
- LANG, W. Ein Fall v. Lebercenenobliteration. Inaug. Diss. Kiel. 1886.
- LANGNER, O. Ueber Gastrostomie. Inaug. Diss. Kiel, 1884.

- LAU, B. Beitrag zur Kenntniss der Wirkung des Strychnins. Inaug. Diss. Kiel, 1886.
- LASKE, C. Die Sehscharfe nach Cataract-Operationen. Inaug. Diss. Kiel, 1888.
- LASKOWSKI, H. Influenza u. Ohr. Inaug. Diss. Königsberg, 1892.
- LATTE, D. Ueber Corpuscula amylacea in den Lungen. Inaug. Diss. Königsberg, 1892.
- LEHMANN, W. Ueber Hereditätsverhältnisse u. ophthalmoscopischen Befund bei der Myopie. Inaug. Diss. Kiel, 1890.
- LEHRRICH, A. Die Azoospermie. Inaug. Diss. Kiel, 1891.
- LEISER, G. Ueber die Häufigkeit u. das Vorkommen der paralytischen Anfälle im Verlauf der progressiven Paralyse der Irren. Inaug. Diss. Jena, 1892.
- LEOBHART, J. Die Retracheotomie wegen Granulationsstenose der Trachea. Inaug. Diss. Kiel, 1888.
- LENE, E. Ueber die Häufigkeit der Schnurleber nach den Befunden des pathologischen Institutes zu Kiel. Inaug. Diss. Kiel, 1891.
- LEUPOLD, B. Beitrag zur Kenntniss der Wirkung des Punicin. Inaug. Diss. Kiel, 1891.
- LINK, M. Ein Fall von Gangraen der Trachea. Inaug. Diss. Kiel, 1891.
- LOBNER, W. Ueber Hautableitung bei Erkrankungen der Hirnhäute. Inaug. Diss. Kiel, 1889.
- LOHRE, P. Beitrag zur Behandlung der Otitis media purulenta. Inaug. Diss. Königsberg, 1891.
- LOTS, F. Ueber einen Fall von jahrlangen Verweilen eines Fremdkörpers in den Bronchien. Inaug. Diss. Jena, 1892.

- LORENZ, F. Ueber den Status epilepticus. Inaug. Diss. Kiel, 1890.
- LORENZ, Otto. Ueber Antipyretica. Inaug. Diss. Jena.
- LOTHHOLZ, KARL. Zur Therapie des Pleuraempyeme. Inaug. Diss. Jena, 1893.
- LOWENBERG, A. Beitrag zur Behandlung der eitrigen Mittelohr-Entzündung mit Berücksichtigung der Bacteriologie des Ohreiters. Inaug. Diss. Königsberg, 1891.
- LUBIMIS, J. Ueber Coma diabeticum. Inaug. Diss. Kiel, 1890.
- LUDERS, C. Ueber das Vorkommen von subpleuralen Lymphdrüsen. Inaug. Diss. Kiel, 1892.
- LUDERS, J. Ueber Cachexia strumipriva. Inaug. Diss. Kiel, 1890.
- LUKENS, H. F. Die Vorstellungsreihen und ihre pädagogische Bedeutung. Inaug. Diss. Jena, 1892.
- LUIB, F. Ueber Geschwülste der Blase. Inaug. Diss. Kiel, 1890.
- LUTZEN, A. Beitrag zu den lokalen Befunden nach Calomelinjectionen. Inaug. Diss. Kiel, 1891.
- MAACK, F. Beitrag zur Kenntniss der Osteome. Inaug. Diss. Kiel, 1889.
- MAES, C. Ein Beitrag zur Ätiologie der Myopie. Inaug. Diss. Kiel, 1884.
- MAGNUSSEN, L. Beiträge zur Diagnostik u. Casuistik der Actinomykose. Inaug. Diss. Kiel, 1885.
- MAHLER, A. Beitrag zur Kenntniss der Wirkung des chloresauren Natriums. Inaug. Diss. Kiel, 1889.
- MAIRE, B. Ein Beitrag zur Localisation der Gehirntumoren. Inaug. Diss. Jena, 1892.

- MALLISON, G. Ein Fall v. traumatischer Reflexpsychose. Inaug. Diss. Königsberg, 1891.
- MAN, CORNELISDE. Ueber die Einwirkung von hohen Temperaturen auf Tuberkelbacillen. Inaug. Diss. Jena, 1893.
- MARS, K. Statistischer Beitrag zur Behandlung der Anämie und Chlorose. Inaug. Diss. Kiel, 1891.
- MARTIN, R. Drei Fälle v. primärer acuter fleghmonoser Faryngitis u. Laryngitis. Inaug. Diss. Kiel, 1890.
- MASURKE, A. Vier Fälle v. Ischius scoliotica. Inaug. Diss. Königsberg, 1891.
- MATTHES, DR. MAX. Untersuchungen über die Pathogenese des Ulcus rotundum ventriculi und über den Einfluss von Verdauungsenzymen auf lebendes und todtcs Gewebe. Jena, 1893.
- MATTHIAS, F. Ueber graphische Darstellung der Actionsstrome des Muskels, besonders am lebenden Menschen. Inaug. Diss. Königsberg, 1891.
- MAY, T. Ueber Arthropathia tabica. Inaug. Diss. Kiel, 1891.
- MAYER, W. Beiträge zur Statistik der Lippengeschwulste. Inaug. Diss. Kiel, 1890.
- MEIER, J. Beitrag zur Kenntniss der Wirkung des Aspidosperium. Inaug. Diss. Kiel, 1891.
- MENNEN, W. Zur Kenntniss der Ostitis albuminosa. Inaug. Diss. Jena, 1892.
- MENNING, J. Beiträge zur Statistik der Kniegelenkssectionen. Inaug. Diss. Kiel, 1883.
- MENTZ, G. Ist es bewiesen dass Trithemius ein Falscher war? Inaug. Diss. Jena, 1892.

- METZ, R. Untersuchungen über die Sulfosauren der drei Amidophenole. Inaug. Diss. Kiel, 1892.
- MEYER, A. Ueber die embolische Verschleppung v. Leberzellen durch die Blutbahn. Inaug. Diss. Kiel, 1888.
- MEYER, F. Beiträge zur Statistik der Zungen carcinome u. deren operativen Behandlung. Inaug. Diss. Kiel, 1888.
- MEYER, H. Knochenabscesse. Inaug. Diss. Kiel, 1887.
- MEYER, J. Beitrag zur Kenntniss der Wirkung des Nicotin. Inaug. Diss. Kiel, 1891.
- MEYER, OTTO. Die Herzfehlerzellen und ihre pathognomonische Bedeutung. Inaug. Diss. Jena, 1893.
- MEYER, P. Zwei Fälle v. metastalischer Hauttuberculose. Inaug. Diss. Kiel, 1889.
- MEYER, W. Ein Beitrag zur Behandlung der Bachtitis mit Phosphor. Inaug. Diss. Kiel, 1885.
- MEYERSAHM, O. Ueber blutige Reposition subcutaner, nicht einzurichtender Fracturen. Inaug. Diss. Kiel, 1881.
- MICHEL, G. Ueber Wandermilz. Inaug. Diss. Jena, 1891.
- MILDENSTEIN, P. Ein Fall v. Contractur des Vorderarm-Flexoren nach Humerus-Fraktur. Inaug. Diss. Kiel, 1888.
- MILLITZER, P. Ueber die Entwicklung der operativen Behandlung von Pleura-Exsudaten. Inaug. Diss. Jena, 1892.
- MINNICH, W. Ueber einen Fall pernicioser progressiver Anämie mit leichten Spinal Symptomen u. anatomischen Veränderungen im Rückenmark. Inaug. Diss. Königsberg, 1891.
- MITTER, J. Beitrag zur Kenntniss des *Balantidium coli* im menschlichen Darmkanale. Inaug. Diss. Kiel, 1891.

- MOECKE, H. Ueber Geschwulstbildung der Thranendruse. Inaug. Diss. Kiel, 1891.
- MONTAG, J. Ueber Trepanation bei Kopfverletzungen. Inaug. Diss. Kiel, 1890.
- MORCK, J. P. A. Beitrag zur pathol. Anatomie der congenitalen Syphilis. Inaug. Diss. Kiel, 1888.
- MOSE, F. Ueber Exenteratio bulbi. Inaug. Diss. Kiel, 1887.
- MUHLSTADT, H. Beitrag zur Kenntniss der Wirkung des Sabadillin. Inaug. Diss. Kiel, 1892.
- MULLER, A. Brillenglaser u. Hornhautlinsen. Inaug. Diss. Kiel, 1889.
- MULTHAUPT, K. B. Beitrag zur Lehre v. der Aktinomykose. Inaug. Diss. Kiel, 1888.
- NEUENBORN, R. Beitrage zur Histologie der Larynxpolypen. Inaug. Diss. Königsberg, 1891.
- NEUHAUS, E. Ein seltener Fall v. Aplasie der Hoden. Inaug. Diss. Kiel, 1890.
- NEYMAN, E. H. Ein Beitrag zur Zundhutenverletzung. Inaug. Diss. Kiel. 1890.
-
- NIEMEYER, H. Ein Fall v. Lungenarterien Embolie nach einer Distorsio pedis. Inaug. Diss. Kiel, 1887.
- NIEMEYER, PAUL. Zehn Nephrektomien nebst Beitragen zur Pathologie der Kompensationsanomalien. Inaug. Diss. Jena.
- NIERHOFF, B. Drei Falle v. Kaiserschnitt. Inaug. Diss. Kiel, 1889.
- NIRSEN, W. Ein Beitrag zur Casuistik der Pulsionsdivertikel der Speiserohre. Inaug. Diss. Kiel, 1884.
- NOERING, A. Ueber einen Fall v. Fibrosarkom des Nervus opticus. Inaug. Diss. Königsberg, 1892.

- NOLTENIUS, H. Beitrag zur Statistik u. pathologischen Anatomie des Diabetes mellitus. Inaug. Diss. Kiel, 1888.
- OETKEN, F. Ueber ableitende Behandlung bei Wirbel- und Rückenmarks-Erkrankungen, Inaug. Diss. Kiel, 1887.
- OTTO, F. Ueber bandformige Hornhauttrübungen. Inaug. Diss. Kiel, 1889.
- OVERBECK, F. Beitrag zu den feineren Veränderungen bei Nierenverletzungen. Inaug. Diss. Kiel, 1891.
- PANS, H. Ueber normales und pathologisches Epithel der harnableitenden Wege. Inaug. Diss. Kiel, 1892.
- PARADIES, PAUL. Ueber Kresole als Desinfectionsmittel mit besonderer Berücksichtigung des Lysols. Inaug. Diss. Jena.
- PAULSEN, S. Ueber Tuberkulome der Nasenhöhle. Inaug. Diss. Kiel, 1890.
- PETERS, G. Ueber Siderosis. Inaug. Diss. Kiel, 1881.
- PETERS, H. Gallenstein Statistik. Inaug. Diss. Kiel, 1890.
- PETERS, J. Ueber Natron salicylicum beim Diabetes mellitus. Inaug. Diss. Keil. 1880,
- PETERS, O. Ueber das Pterygium. Inaug. Diss. Kiel, 1890.
- PETERS, T. Ueber die Resultate der Keuchhustenbehandlung in der medicinischen Poliklinik zu Kiel während der letzten Epidemie (Sommer 1889.) Inaug. Diss. Kiel, 1889.
- PETERMOLLER, F. Ueber den sogenannten Geschlechtstypus des menschlichen Brustbeines. Inaug. Diss. Kiel, 1890.
- PETERSON, G. Ueber die Stoffwechselforgänge beim Intermitansanfall. Inaug. Diss. Kiel, 1881.
- PETERSON, H. Eine Magenresection zur Heilung einer Magenbauchwandfistel. Inaug. Diss. Kiel, 1880.

- PETERSON, J. Beitrag zur Kenntniss der Enchondrome. Inaug. Diss. Kiel, 1889.
- PETERSON, J. S. Ueber einen Fall v. Melanosarkom des Rectums. Inaug. Diss. Kiel, 1888.
- PETERSON, M. Ueber Hornhautflecke als Ursache der Myopie u. Anisotropie. Inaug. Diss. Kiel, 1887.
- PETERSON-BORSTEL, W. Gallensteinbildung in ihrer Beziehung zu Krebs u. chronischer Endarteritis. Inaug. Diss. Kiel, 1888.
- PFEIFFER, R. Zwei Falle v. Tabes incipiens. Inaug. Diss. Königsberg, 1892.
- PHILIPPS, P. Ueber die Neubildung v. Arterien mit stark verdickter Muscularis in Pleuraschwarten. Inaug. Diss. Kiel, 1891.
- PIECK, A. Ein Fall v. fieberhafter disseminierter Miliarcarcinose. Inaug. Diss. Königsberg, 1891.
- PIROW, F. Statistik des Keuchhusten, Inaug. Diss. Kiel, 1888.
- PLAMBECK, C. Ein Beitrag zur Statistik u. Verbreitung der Tuberkulose im Alter von 16–20 Jahren. Inaug. Diss. Kiel, 1885.
- PLEHN, A. 35 Falle v. Schadel-Fractur. Inaug. Diss. Kiel, 1886.
- PLEHN, F. Beitrag zur Lehre vom chronischen Hydrocephalus. Inaug. Diss. Kiel, 1887.
- PODACK, M. Beitrag zur Histologie u. Funktion der Schilddrüse. Inaug. Diss. Königsberg, 1892.
- PODDEY, H. Drie Falle v. idiopathischer acuter gelber Leberatrophie, Inaug. Diss. Königsberg, 1892.
- POELCHAN, G. Ein Fall v. Perodaktylie. Inaug. Diss. Königsberg, 1891.

- POEPSSEL, B. Ueber die Tuberculose des Unterkiefers. Inaug. Diss. Kiel, 1892.
- POHL, W. Pyoktanin als Antisepticum. Inaug. Diss. Kiel, 1890.
- POLLMANN, H. Ueber die Principien bei Schieloperationen. Inaug. Diss. Kiel, 1888.
- PRAUST, M. Uber Laparotomie v. Darmnaht bei Schuss u. Stichverletzungen. Inaug. Diss. Kiel, 1890.
- PRUTZ, W. Ueber das anatomische Verhalten der Leber bei der puerperalen Ekampsie. Inaug. Diss. Königsberg, 1892.
- QUINTAR, J. Operative Behandlung der Carcinome des Dickdarmes mit besonderer Berücksichtigung der Darmresektion. Inaug. Diss. Königsberg, 1892.
- RASSAN, G. Ueber Sarcomatose des Dunndarms. Inaug. Diss. Kiel, 1891.
- RASSLER, A. Beitrag zur Ätiologie des Morbus gallicus. Inaug. Diss. Kiel, 1891.
- RATHMANN, O. Zur Kenntniss der Geschwulste in der männlichen Brustdrüse. Inaug. Diss. Jena, 1892.
- RAU J. Die malignen Furunkel des Gesichts und der Lippen. Inaug. Diss. Jena, 1892.
- RAUERT, E. Falle v. sogen. Fetthernien in der Bauchwand. Inaug. Diss. Kiel, 1890.
- REESE, J. Ueber die Wendung bei eugem Becken. Inaug. Diss. Kiel, 1891.
- REGENBOGEN, E. Ueber die Behandlung der tiefen Atheromcysten am Halse. Inaug. Diss. Kiel, 1892.
- REHDER, J. Ueber die Sectio alta und die an hiesiger chirurgischer Klinik und Poliklinik ausgeführten Operationen derselben. Inaug. Diss. Kiel, 1881.

- REHER, H. Beitrag zur Casuistik der Oesofagus-Erkrankungen. Inaug. Diss. Kiel, 1885.
- REICKE, J. Zu Johann Christoph Gottscheds Lehrjahren auf der Königsberger Universität. Inaug. Diss. Königsberg, 1892.
- REINEBOTH, HERMANN. Ueber die Annahung des Wanderniere. Inaug. Diss. Jena.
- REINKE, F. Untersuchungen über das Verhältniss der v. Arnold beschriebenen Kernformen zur Mitose u. Amitose. Inaug. Diss. Kiel, 1891.
- REINKING, O. Beitrag zur Kenntniss der Flegmonösen Gastritis. Inaug. Diss. Kiel, 1890.
- REUTER, A. Ueber die Wirkung des Extractum Hyoscyami bei Enteralgie. Inaug. Diss. Kiel, 1888.
- RHEDER, B. Die subpleuralen Ecclymosen beim Erstickungstode. Inaug. Diss. Kiel, 1880.
- RHENIDORFF, O. Ueber Kehlkopftuberculose im Kindesalter im Anschluss an einen Fall v. Pseudoparalyse u. Tuberculose. Inaug. Diss. Königsberg, 1891.
-
- RICHTER, W. Ueber die Betheiligung der Aorta an endocarditischen Prozessen. Inaug. Diss. Kiel, 1891.
- Funfzehn Fälle v. vaginaler Totalexstirpation des Uterus aus der Königlichen Universitäts-Frauen-Klinik zu Königsberg. Inaug. Diss. Königsberg, 1891.
- RIEMANN, E. Ueber den Zusammenhang v. Nierendislokation und Magenerweiterung. Inaug. Diss. Kiel, 1888.
- RIESENFELD, P. Ueber Hysterie bei Kindern. Inaug. Diss. Kiel, 1887.
- RIESS, E. Ueber den Einfluss des Bronchial-Katarrhs auf die Aufnahme u. Ausscheidung inhalirten Kohlenstaubes. Inaug. Diss. Königsberg, 1892.

- ROBERT, F. Ueber Wiederbildung Quergestreifter Muskelfasern. Inaug. Diss. Kiel, 1890.
- ROESSLER, L. Zur Ätiologie der Erblindungen. Inaug. Diss. Kiel, 1889.
- ROHDE, H. Zur Pathologie des Pankreas. Inaug. Diss. Kiel, 1890.
- ROHE, G. H. Recent Advances in Preventive Medicine. Jour. Amer. Medical Association, 1887.
- ROHRBACH, F. Ueber das Trachom in Schleswig-Holstein. Inaug. Diss. Kiel, 1891.
- ROHRS, B. Ueber die Extirpation der Thranensacks. Inaug. Diss. Kiel, 1890.
- ROHWEDDER, H. Der Primäre Leberkrebs u. sein Verhältniss zur Leberkirschose. Inaug. Diss. Kiel, 1888.
- ROPCKE, A. Beitrag zur Ätiologie der Oesofaguscarcinome. Inaug. Diss. Kiel, 1889.
- RUBSAMEN, O. Ein Beitrag zur Kenntniss der Laryngitis Hypoglottica. Inaug. Diss. Königsberg, 1892.
- RUDOLPHI, G. Beitrag zur Kenntniss der Wirkung des Cyankalium. Inaug. Diss. Kiel, 1891.
- RÜHBERG, M. Ueber Zundhutschenverletzungen des Auges. Inaug. Diss. Kiel, 1889.
- RUMPF, W. Alkalimetrische Untersuchungen des Blutes bei Krankheiten. Inaug. Diss. Kiel, 1891.
- SARBAZIN, FRANZ. Über die doppelseitige Huftgelenkresektion. Inaug. Diss. Jena.
- SAUER, R. Beitrag zur Luxatio lentis in cameram anteriorem. Inaug. Diss. Kiel, 1888.
- SCHANTZ, H. Vier Fälle v. accessorischen Ovarien. Inaug. Diss. Kiel, 1890.

- SCHANZ, ALFRED. Zur Casuistik der apoplectiformen Balbarparalyse mit Demenz. Inaug. Diss. Jena.
- SCHARTAN, K. Ein Beitrag zur Kenntniss der Aktinomykose. Inaug. Diss. Kiel, 1890.
- SCHIEFFEL, J. Beiträge zur Kenntniss der Kohlenoxydvergiftung. Inaug. Diss. Kiel, 1891.
- SCHIEFFER, A. Beitrag zur Statistik der modificirten Linear-Extraction. Inaug. Diss. Kiel, 1881.
- SCHIRREN, C. Ein Beitrag zur Kenntniss v. der Atrofie der Magenschleimhaut. Inaug. Diss. Kiel, 1888.
- SCHLERETH, F. Zwei Fälle v. primarem Lungenkrebs. Inaug. Diss. Kiel, 1888.
- SCHLUTER, K. Zur Statistik u. Ätiologie der Pleuritis. Inaug. Diss. Kiel, 1891.
- SCHMAUSER, J. Die Schicksale der Dunndarmdivertikel. Inaug. Diss. Kiel, 1891.
- SCHMALMACK, J. Die pathologische Anatomie der tuberkulösen Peritonitis nach den Ergebnissen v. 64 Sectionen. Inaug. Diss. Kiel, 1889.
-
- SCHMIDT, C. Beitrag zur Casuistik der Retinitis traumatica. Inaug. Diss. Kiel, 1890.
- Beitrag zur Lehre v. den Schadelverletzungen während der Geburt. Inaug. Diss. Kiel, 1890.
- SCHMIDT, F. Ein Fall von primarem Gallenblasenkrebs. Inaug. Diss. Kiel, 1891.
- SCHMIDT, THEODOR. Beitrag zur Lehre von der Porencephalie. Inaug. Diss. Jena.
- SCHMIDT-MOUNARD C. Ueber Pathologie u. Prognose der Gelenktuberculose, insbesondere des Fusses. Inaug. Diss. Kiel, 1888.

- SCHMITZ, E. Beitrag zur Lehre vom Glioma retinae. Inaug. Diss. Kiel, 1891.
- SCHOW, W. Zur operativen Behandlung der Pleuritis. Inaug. Diss. Kiel, 1891.
- SCHROEDER, C. Ueber die Wirkung der Ueberosinumsaure bei Epilepsie. Inaug. Diss. Kiel, 1888.
- SCHROEDER, J. HERMANN. Untersuchungen uber das Blutgefass-System des ausseren Ohres. Inaug. Diss. Jena.
- SCHULER, C. Ueber einen Fall v. Uterus duplex septus cum vagina septa. Inaug. Diss. Kiel, 1890.
- SCHULTE, M. Entzündliche Spontanfrakturen des Oberschenkels für bosartige Knochenneubildungen gehalten. Inaug. Diss. Kiel, 1888.
- SCHULTZ, W. Ueber die Discission des Wachstaars. Inaug. Diss. Kiel, 1891.
- SCHULTZE, C. Ueber Anomalien des Schild-Knorpels. Inaug. Diss. Kiel, 1890.
- SCHULZE, B. Beitrag zur Statistik der Tuberculose verbunden mit Herzklappen. Inaug. Diss. Kiel, 1891.
- SCHUTZE, A. Ueber Facialislahmung bei Neugeborenen unter Mittheilung dreier beobachteter Falle. Inaug. Diss. Königsberg, 1891.
- SCHUTT H. Reine bacillare Erkrankung epitelbedeckter Flächen bei primärer Tuberculose des Urogenitalapparates. Inaug. Diss. Kiel, 1889.
- SCHUTT, P. Beitrag zur Lehre von den Schilddrüsenkrebsen. Inaug. Diss. Kiel, 1891.
- SCHWABE, A. Ueber Frühbehandlung der Osteomyelites durch Trepanation resp. Aufmeisselung des Knochens. Inaug. Diss. Kiel, 1890.

- SCHWÄRZ, E. Ueber Hydronefroſe im Kindesalter. Inaug. Diss. Kiel, 1891.
- SCHWARTZ, V. Ueber die Verletzung der Arteria mammaria interna. Inaug. Diss. Königsberg, 1892.
- SCHWER, W. Ein Beitrag zur Statistik und Anatomie der Tuberkulose in Kindesalter. Inaug. Diss. Kiel, 1884.
- SEEGELKEN, CARL. Ueber Komplikation der Schwangerschaft mit Carcinom des Cervix. Inaug. Diss. Jena.
- SICK, K. Ein seltener Fall von allgemeiner Tuberkulose. Inaug. Diss. Kiel, 1892.
- SIEGL, P. Beitrag zur Kenntniss der Wirkung des Pikrotoxin. Inaug. Diss. Kiel, 1891.
- SIEVERS, L. Schmarotzer-Statistik aus den Section-Befunden des pathologischen Instituts zu Kiel. Inaug. Diss. Kiel, 1887.
- SNELL, R. Beitrag zur Kenntniss der Wirkung des Cocains. Inaug. Diss. Kiel, 1891.
- SOUSA, A. V. de. Zwei Fälle von "Juveniler Form der Muskelatrophie." Inaug. Diss. Kiel, 1888.
- SPRANGENBERG, E. Beitrag zur Kenntniss der Wirkung des Cytisin. Inaug. Diss. Kiel, 1891.
- STAHL, C. Beitrag zur Casuistik der Schadelverletzungen. Inaug. Diss. Kiel, 1887.
- STALHERM, H. Ueber Kyfose u. ihre Beziehung zu den Veränderungen der inneren Organe. Inaug. Diss. Kiel, 1892.
- STARK, W. von. Die Lage des Spitzenstosses u. die Percussion des Herzes im Kindesalter. Inaug. Diss. Kiel, 1888.
- STECKHAM, O. Beitrag zur Kenntniss der Wirkung Aconitin. Inaug. Diss. Kiel, 1891.
- STEINMANN, K. Einige Fälle v. Magengeschwür in jugendlichen Alter. Inaug. Diss. Kiel, 1890.

- STEMANN, E. Beiträge zur Kenntniss der Salpingitis tuberculosa u. gonorrhoeica. Inaug. Diss. Kiel, 1888.
- STENDEL, H. Zur Casuistik der erworbenen Zwerchfellsbrüche. Inaug. Diss. Kiel, 1889.
- STENDER, A. Ein Fall v. Hodenkrebs. Inaug. Diss. Kiel, 1890.
- STOERMER, R. Der Diabetes insipidus. Inaug. Diss. Kiel, 1892.
- STOLZ, N. Beitrag zur Statistik der Radicaloperation der Hydrocele durch punctio mit nachfolgender Injection v. Lugolischer Lösung. Inaug. Diss. Kiel, 1883.
- STOLZMANN, J. Beitrag zur Kenntniss der Wirkung der Milchsäuren. Inaug. Diss. Kiel, 1892.
- STIEDA, A. Ueber die Kloake u. das Receptaculum seminis der weiblichen Tritonen. Inaug. Diss. Königsberg, 1891.
- STROETMANN, J. Beiträge zur Statistik u. pathologischen Anatomie der Darmschiebungen. Inaug. Diss. Kiel, 1890.
- STRUCK, R. Ueber das Verhältniss des Chorea u. der Scarlatina zum acuten Gelenkrheumatismus. Inaug. Diss. Kiel, 1887.
- STUHLEN, A. Ueber Pikrotoxin und Pikrotoxinin. Inaug. Diss. Kiel, 1892.
- SULTAN, G. Ueber Lymphangiome. Inaug. Diss. Königsberg, 1891.
- TARNZER, P. Ueber das Ulerythema ophyrogenes eine noch nicht beschriebene Hautkrankheit. Inaug. Diss. Kiel, 1889.
- TETENS, T. Ein Beitrag zur Lehre v. den Oesopagus-Divertikeln. Inaug. Diss. Kiel, 1888.

- THADEN, C. Ueber das Senile Staphylom. Inaug. Diss. Kiel, 1880.
- THAYSEN, L. Statistik der Diphtheritisfälle auf der medizinischen Klinik zu Kiel in den Jahren 1879–88. Inaug. Diss. Kiel, 1889.
- THEDE, E. Die Erfolge der Laparotomie bei malignen Geschwulsten der Abdominalorgane insbesondere der Ovarien. Inaug. Diss. Kiel, 1892.
- THERIG, E. Ein Beitrag zur Statistik der Zahncaries. Inaug. Diss. Kiel, 1890.
- THIELE, W. Statistische Erhebungen über die Häufigkeit, Complicationen und Ätiologie der Endocarditis. Inaug. Diss. Kiel, 1888.
- THILO, F. Zur Therapie des Myeloidsarcoms. Inaug. Diss. Kiel, 1889.
- TOPP, J. Beitrag zur Lehre v. dem Darmwandbruchen. Inaug. Diss. Kiel, 1890.
- VAN DE WARKER, E. Use of the Seton in the Treatment of some cases of Chronic Affections of the Womb. New York, 1872. 29d.
- VERMENLEN, F. H. A. Statistische Untersuchungen zur Morbidität u. Mortalität im Wochenbette. Inaug. Diss. Kiel, 1891.
- VERWORN, M. Gleichgewicht und Otolithenorgan. Inaug. Diss. Jena, 1891.
- VOLCKERS, G. Zur Behandlung des Mastdarmkrebses. Inaug. Diss. Kiel, 1883.
- WAGNER, P. A. E. Ueber die diuretische Wirkung des Borax. Inaug. Diss. Kiel, 1892.
- WAHL, V. Ueber die Häufigkeit der Epifysen-Diafysen-Erkrankung bei Syphilis congenita. Inaug. Diss. Kiel, 1892.

- WALTER, C. Beitrag zur Lehre v. Hydrocephalus. Inaug. Diss. Kiel, 1888.
- WARDA, W. Ueber die sensiblen und sensorischen Störungen bei der traumatischen Pschyonenrose. Inaug. Diss. Jena, 1892.
- WARNSTEDT, G. Ein Fall v. tödtlicher Fettembolie nach Weichteilverletzung. Inaug. Diss. Kiel, 1888.
- WEBER, R. Beitrag zur Statistik der Echinokokkenkrankheit. Inaug. Diss. Kiel, 1887.
- WEDEKIND, G. Anenrysmia der Arteria anonyma iliaca sinistra. Inaug. Diss. Jena, 1892.
- WEFELSCHIED, G. Beiträge zur pathologischen Anatomie der Spondylitis u. Arthritis deformans der Halswirbelsäule. Inaug. Diss. Kiel, 1881.
- WEFERS, O. Ueber Chloralamid. Inaug. Diss. Jena, 1891.
- WEGNER, E. Zur Casuistik der Hirntumoren. Inaug. Diss. Kiel, 1887.
- WEICHEL, OTTO. Beitrag zur Frage von der embryonalen Uebertragbarkeit der Tuberculose. Inaug. Diss. Jena, 1893.
- WEICKER, H. Beitrag zur Kenntniss der Wirkung des Curarin. Inaug. Diss. Kiel, 1891.
- WEIDMANN, O. Ueber Psychosen bei Typhus abdominalis. Inaug. Diss. Königsberg, 1891.
- WEIGEL, J. O. Zur Pathogenese und Therapie der Thrombose des sinus transversus. Inaug. Diss. Jena, 1891.
- WEILER, J. Die Bildungsanomalien der Nebennieren u. deren pathologische Bedeutung. Inaug. Diss. Kiel, 1885.
- WERNER, M. Zur Wechselwirkung zwischen Syphilis und anderen Krankheiten. Inaug. Diss. Jena, 1892.

- WESSEL, P. Ein Fall v. Oesophaguscarcinom mit Uebergreifen auf den linken Vorhof Metastase in der Dura mater. Inaug. Diss. Königsberg, 1891.
- WESTEDT, W. Sechs Falle v. Morbus Basedowu. Inaug. Diss. Kiel, 1889.
- WEYHE, E. Ueber die Häufigkeit v. Hamorrhagien in Schadel u. Schadelinhalt bei Säuglingen. Inaug. Diss. Kiel, 1889.
- WICHMANN, J. Ueber das Verhalten des Trichocephalus dispar zur Darmschleimhaut. Inaug. Diss. Kiel, 1889.
- WICHT, L. Zur Ätiologie u. Statistik der amaloiden Degeneration. Inaug. Diss. Kiel, 1889.
- WEICK, O. Ueber die Discisio maturans. Inaug. Diss. Kiel, 1883.
- WIESCHEBRINK, H. Ueber die schubweise auftretende entzündliche Schwellung bei Lymphangiomen. Inaug. Diss. Jena.
- WIESE, O. Ein Beitrag zur Laparotomie bei Bauchfelltuberculose. Inaug. Diss. Kiel, 1880.
- WIGGER, B. Ueber Hernien mit besonderem Inhalt. Inaug. Diss. Kiel, 1891.
- WILCKENS, M. Die Nabelbrüche Kleiner Kinder und deren Behandlung. Inaug. Diss. Kiel, 1892.
- WILDE, M. Ueber das Vorkommen des Krebses bei jugendlichen Individuen. Inaug. Diss. Kiel, 1892.
- WILDFANG, J. C. Die Tuberculose der Tymus. Inaug. Diss. Kiel, 1883.
- WILHELM, C. Das Verhältniss zwischen Gonorrhoe u. Tuberculose. Inaug. Diss. Königsberg, 1892.
- WILIGERODT, W. Ueber Spontanheilung des Strabismus convergens. Inaug. Diss. Kiel, 1892.

- WILL, A. Ein interessanter Fall v. Durchbruch einer bacillenhaltigen verkasteten Trachealdruse in die Vena cava superior. Inaug. Diss. Kiel, 1889.
- WILLUTZKI, E. Ueber ein primares Sarkom des Ureters. Inaug. Diss. Königsberg, 1891.
- WINZERLING, PAUL. Ein Beitrag zur Casuistik des primären Pleuraechinococcus. Inaug. Diss. Jena.
- WITTRÖCK, O. Beitrag zur Kenntniss der Zungengeschwulste. Inaug. Diss. Kiel, 1889.
- WOLFRING, W. Statistik der Masern, des Scharlachs u. der Varicellen. Inaug. Diss. Kiel, 1887.
- WOLTER, H. Ein Fall von chronischer Pyämie. Inaug. Diss. Kiel, 1892.
- WOLTERS, J. Ueber Hydrocele feminae. Inaug. Diss. Kiel, 1891.
- WULF, P. Entstehung der Dickdarmkrebse aus Darmpolypen. Inaug. Diss. Kiel, 1892.
- WULLENWERBER, E. Zur normalen und pathologischen Anatomie der Mesenterialdrüsen. Inaug. Diss. Kiel, 1889.
- ZAPERNICK, W. Ueber Sehnennaht u. Sehnenplastik. Inaug. Diss. Kiel, 1891.
- ZARNIKO, C. Beitrag zur Kenntniss der Diphtheriebacillus. Inaug. Diss. Kiel, 1889.
- ZELASINSKI, F. VON. Zur Kenntniss der Vergiftung durch chloresaure Salze. Inaug. Diss. Königsberg, 1891.
- ZUCCARELLI, A. Da Deficienti ad Idiota. Studio Medico-Legale.

METALLURGY.

NON-SERIALS.

Pamphlets, 15e.

EGLESTON, T. The Method of Collecting Flue-Dust at Ems on the Lahn. Amer. Inst. of Mining Engineers, 1883.

GODSHALL, L. D. A Review of the Russel Process. Proceedings of the Colorado Scientific Society.

VOGT, J. H. L. Pa Gasanalyser Grundade Undersokningar af sulu och rakoppar-smaltningar m. m. uti Skaktugnar.

— Om Verdens Guld- Solv- og Kobber- Produktion.

— Einige Bemerkungen uber die Zusammensetzung der Krystallisirten Schlacken.

— Om Slaggers af Sammensattningen Beroende Kristallisations-Torhallanden.

METEOROLOGY.

SERIALS.

BRUNN [Germany] Meteorologische Commission.
Bericht, VIII. (1890) + 20c

BUENOS AYRES [Argentine Rep.] Oficina Meteorologica Argentina.
Anales, Vol. I. 20e

CHRISTIANIA [Norway] Norwegisches Meteorologisches Institute.
Jahrbuch, 1885-89, 90. + 20e

- HELSINGFORS [Finland] Societe des Sciences de Finlande.
Observations Meteorologiques, Annees 1873, 78. 20c
- Observatoire Magnetique et Meteorologique.
Report, 1873. 20c
- MOSCOW [Russia] Landwirthschaftliche Akademie.
Meteorologische Beobachtungen, 1888, 1889, pt.
1, 1890. + 21c
- ST. PETERSBURG [Russia] Kaiserliche Akademie der Wis-
senschaften.
Repertorium fur Meteorologie, Vols. IV-XIV,
XV. + 21d
Suppl. zum Repertorium fur Meteorologie, Vols.
I-V. + 21d
Atlas to Suppl. Rep. fur Meteorologie, Vols I,
II. + 21d
- SANTIAGO [Chili] Oficina Central Meteorologica.
Anuario, Vol. XVIII, pts. 1-4. + 20c
- UTRECHT [Holland] Koninklijk Nederlandsch Meteorolog-
isch Instituut.
Meteorologisch Jaarboek, 1870, 71, 75. 20c
- WASHINGTON [D. C.] U. S. War Department.
Reports of Signal Officer, 1880, 81, 83, 84, 86,
87, pt 1; 88, 89, 1-2. 21a
Professional Papers of Signal Service, Nos. 2, 3,
5-8, 10-13, 15, 16, 18. 20b

NON-SERIALS.

Pamphlets, 21d.

- BALLOU, S. M. The Eye of the Storm. Amer. Meteorological
Jour., vol. IX, Nos. 2 and 3.
- BENCKE, C. Ueber die Regenzeiten in Ostafrika. Inaug. Diss.
Jena, 1890.

BODIGE, N. Ueber die Uebereinstimmung des nordlichen insbesondere des nordwestlichen Deutschlands im Witterungscharakter. Inaug. Diss. Jena, 1891.

DAVIS, W. M. The General Winds of the Atlantic Ocean. Amer. Meteorological Journ., March, 1893.

— Outline of Elementary Meteorology. A Synopsis of Course "Geology I" at Harvard College, 1892-93.

GULDBERD, C. M. AND MOHN, H. Etudes sur les Mouvements de l'atmosphere. Parts 1 and 2. Christiania, 1876.

LAMP, J. Neue Berechnung der Parallaxe von 61 Cygni aus den Beobachtungen von Schweizer in Moskau, 1863-1866. Inaug. Diss. Kiel, 1883.

LEMSTROM, SELIM, AND BIESE, ERNEST. Exploration International des Regions Polaire, 1882-83, et 1883-84. Expedition Polaire Finlandaise, Vol. I, Meteorologie. 21d.

MOHN, H. Studier over Nedborens Varighed og Taethed i Norge. Christiania, 1888.

— Norges Vind- og Stormsstatistik.

NATURWISSENSCHAFTLICHER VEREIN. Tabellen ueber den Flacheneinhalt des Bremischen Staats, den Wasserstand der Wasser und die Witterungsverhaltnisse des Jahres 1871. Jahrbuch fur die Amtliche Statistik des Bremischen Staats, vol. V, No. 2.

PRESTEL, M. A. F. Ergebnisse der Witterungs-Beobachtungen von 1864 bis 1873. Kleine Schriften der Naturforschenden Gesellschaft in Emden.

ROWELL, G. A. On the Origin of the Great Cyclones. Oxford Chronicle, Nov. 16, 1872.

— Papers on the Cause of Rain, Storms, the Aurora and Terrestrial Magnetism.

- SANTEE, T. Notes on the Tornado of Aug. 19, 1890, in Luzerne and Columbia Counties. Wyoming Hist. and Geol. Soc., 1890.
- DE SAUSSURE, HORACE BENEDICT. Observations Meteorologiques faites en Col du Geant, du 5 au 18 Juillet, 1788. Geneva, 1891.
- SEUR, C. Windrosen des Sudlichen Norwegens. Christiania, 1876.
- SNELLEN, M. Le Telemeteorographe d'Olland.

MINERALOGY.

SERIALS.

- KIEL [Germany] Mineralogisches Institut der Universitat Kiel.
Mittheilungen, Vol. I (1888-1892). + 14b
- PADUA [Italy] Revista di Mineralogia e Cristallografia Italiana (Directed by R. Panebianco).
Vols. VII-X. + 14b
- PARIS [France] Notice Statistique sur le Chili et Catalogue des Mineraux. 15b
- ST. PETERSBURG [Russia] Russisch-Kaiserliche Mineralogische Gesellschaft.
Verhandlungen 2d Ser. Vols. X-XXIX. + 14b
- WASHINGTON [D. C.] U. S. Geological Survey.
Mineral Resources of the United States, 1882-84, 86-90. + 18b
- U. S. Treasury Department.
Mineral Resources West of the Rocky Mountains.
Report 1872-73. 18c

NON-SERIALS.

Pamphlets, 14a.

- ARTINI, E. Della forma cristallina di due nuovi composti organici. *Revista di Mineralogia e Cristallografia*, vol. X, fasc. VI, p. 90.
- BACKSTROM, H. Elektrisches u. thermisches Leitungsvermogen des Eisenglanzes. Stockholm, 1888.
- Beitrage zur Kenntniss der Thermoelectricitat der Krystalle. Stockholm, 1888.
- BACKSTROM H. AND BROGGER, W. C. Ueber den Dahllit ein neues Mineral v. Odegarden Bamle, Norwegen. Stockholm, 1888.
- BJERKEN, P. Nagra Undersokningar ofver Accidentell Dubbel brytning hos Gelatinosa Amnen. Upsala, 1890.
- BRAUNS, REINHARD. Die optischen Anomalien der Krystalle. (Preisschrift Furstlich Jablonowski Gesellschaft). Leipzig, 1891. 13e.
- BUCCA, L. Contribuzione allo studio geologico dell' Abissinia. *Rivista di Mineralogia e Cristallografia*, vol. X, fasc. VI, pp. 90-94.
- CLARKE, F. W. Note on the Constitution of Ptilolite and Mordenite. *American Journal of Science*, vol. XLIV, August, 1892.
- COHEN, E. Titaneisen v. den Diamantfeldern in Sud-Afrika. *Neues Jahrbuch fur Mineralogie, etc.*, 1877, pp. 1-2.
- Review of Nordenskiold's *Mineralogische Beitrage 6* (no title.) *Ibid.*, 1879, pp. 77-84.
- Ueber einen Aventurinquarz aus Ostindien. *Versamml des Oberrheinisch. geol. Vereins zu Durkheim, bayr. Rheinpalz.*, am 13, 14 u. 15, Apr. 1882.

- COHEN, E.—continued. Ueber Jadeit von Thibet. Neues Jahrbuch für Mineralogie, etc., 1884, Bd. I, pp. 71–73.
- Ueber eine Pseudomorphose nach Markasit aus der Kreide von Arcona auf Rugen. Sitzungsberichte der naturwiss. Vereins für Neuvorpommern und Rugen, 1886, pp. 1–4.
- Ueber Speckstein, Pseudofit u. dichten Muscovit aus Sud-Afrika. Neues Jahrbuch für Mineralogie, etc., 1887, Bd. I, pp. 119–124.
- Ueber pleochroitische Hofe im Biotit. Ibid., 1888, Bd. I, pp. 165–169.]
- Ueber den Granat der sudafricanischen Diamantfelder u. über den Chromgehalt der Pyrope. Mittheilungen des naturwiss. Vereins für Neuvorpommern u. Rugen, 1888, pp. 1–4.
- Optischer Schlüssel zur Bestimmung des Krystallsystems v. Mineralien in Gesteinsdunnschliffen.
- COMSTOCK, T. B. Occurrence of tin in Central Texas.
- CROSS W. and EAKINS, L. G. A new Occurrence of Ptilolite. American Journal of Science, vol. XLIV, Aug., 1892.
- FLETCHER, L. An Introduction to the Study of Minerals. 19c.
- An Introduction to Study of Meteorites. 19c.
- Students Index to Collection of Minerals. 19c.
- A Guide to the Mineral Gallery. (See Brit. Museum of Nat. Hist.) 19c
- FRIEDEL, G. Sulla Melanoflogite. Revista di Mineralogia e Cristallografia, vol. X, fasc. VI, pp. 89–90.
- GROTH, PAUL. Ueber die Molekularbeschaffenheit der Krystalle. Festrede Munich, 1888.
- HAEGE, T. Die Mineralien des Siegerlandes und der angrenzenden Bezirke. Inaug. Diss. Jena, 1888.

- HOBBS, W. H. On a Rose-colored Lime- and Alumina-bearing Variety of Talc. *American Journal of Science*, vol. XLV, May, 1893.
- VON JANSON, A. Die Mineralien-Sammlung des Rittergutsbesitzers A von Janson auf Schloss Gerdauden in Ostpreussen.
- JENNEY, W. P. The Mineral Wealth, Climate and Rainfall, and Natural Resources of the Black Hills of Dakota. Washington, D. C., 1876. 16d.
- HUGO, L. Essays on Crystallography. Paris, 1867. 14a.
- KUNZ, G. F. The Gem collection of the U. S. National Museum. Report of the Smithsonian Institution, 1885-1886, part 2, pages 267-275. Washington, 1888.
- Precious Stones. Abstract from "Mineral Resources of the U. S. for 1886. Washington, 1887.
- On a large Garnet from New York Island. New York Academy of Sciences. Read Dec. 7, 1885, and May 30, 1886.
- Mineralogical Notes. Proceedings of the American Association for the Advancement of Science, vol. XXXIV, Ann Arbor meeting, Aug. 1885, pp. 237-258.
- Article on Precious Stones from Appleton's Physical Geography. New York, 1892.
- LUCAS, J. Mines and Mineral Statistics of New South Wales. Sidney, 1875. 15e.
- NOELTING, J. Ueber das Verhältniss der sogenannten Schalenblende zur regulären Blende u. zum hexagonalen Wurtzit. Inaug. Diss. Kiel, 1887.
- PANEBIANCO, R. Sulla forma cristallino della melanofogite. *Revista di Mineralogia e Cristallografia*, vol. X, fasc VI, pp. 81-84.

- PETERSON, G. W. Studier ofver Gadolinit, Upsala, 1890.
- PICCINI, A. e GIORGIS, G. Fluossivanaditi e fluossipovanaditi e fluovanaditi. *Rivista di Mineralogia e Cristallografia*, vol. X, fasc. VI, pp. 85-89.
- RICHARD, T. A. Certain Dissimilar Occurrences of Gold-Bearing Quartz. Colorado Scientific Soc. in Denver, 1893.
- SCHWEITZER, J. Krystallographische Beschreibung des Eisenglanzes u. des Fahlerzes von Framont. Inaug. Diss. Strassburg, 1892.
- SPEZIA, G. Sull' Origine dell Solfo nei Giacimenti Solfiferi della Sicilia. Turin, 1892.
- STOBER, F. Mittheilungen uber den Kalkspath von Elsass-Lothringen. Inaug. Diss. Strassburg, 1892.
- WADSWORTH, M. E. The Argillite and Conglomerate of the Boston Basin. *Proc. Boston Soc. Nat. Hist.*, vol. XXII, pp. 130-133.
- WEINSCHENK, E. Beitrage zur Mineralsynthese. *Zeitschrift fur Krystallographie*, vol. XVII, pp. 486-504.
- WILLIAMS, G. H. Cause of the Apparently Perfect Cleavage in American Spheue (Titanite). *Amer. Jour. Sci.*, vol. XXIX, pp. 486-490.
- On the Hornblende of St. Lawrence County, N. Y., and its Gliding Planes. *Ibid.*, vol. XXXIX, pp. 352-358.
- On the Paramorphosis of Pyroxene to Hornblende in Rocks. *Ibid.*, vol. XXVIII, pp. 258-268.
- On a Remarkable Crystal of Pyrite from Baltimore County, Md. *Johns Hopkins University Circulars*, No. 52, 1886.
- Note on Some Remarkable Crystals of Pyroxene from Orange County, N. Y. *Amer. Jour. Sci.*, vol. XXXIV, pp. 275-276.

- WILLIAMS, G. H.—continued. On the Crystal Form of Metallic Zinc. *Am. Chemical Jour.*, vol. XI, No. 4.
- Syllabus of Lectures on Optical Crystallography.
- Colestin von Mineral County, West Virginia. *Zeitschrift für Krystallographie*, vol. XVIII, No. 1.
- On the Possibility of Hemihedrism in the Monoclinic Crystal System, with Especial Reference to the Hemihedrism of Pyroxene. *Amer. Jour. Sci.*, vol. XXXVIII, pp. 115-120.
- Anglesite, Cerussite and Sulphur from the Mountain View Lead Mine, near Union Bridge, Carroll County, Md. *Johns Hopkins University Circulars*, No. 87.
- AND GILL, A. C. Contributions to the Mineralogy of Maryland. *Ibid.*, No. 75.

MINING.

SERIALS.

- GOLDEN [Colorado] Colorado State School of Mines.
Annual Report to Governor, 1885-1887, 88-90. + 19a
- NEWCASTLE [England] North of England Mining and Mechanical Engineers.
Transactions. Vols. XII-XVII, XXIII-XXX, XXXI, pts 1-3, XXIV 1-6, XXXV 1-3, XXXVI 2-4, XXXVII 1-6, XXXVIII 1-6, XXXIX 1, XL 1-4. + 18a&b
Index of Vols. I-XXV, (1852-76). 18a
- Council of Mining and Mechanical Engineers. Northumberland and Durham Borings and Sinkings.
Part I, A-B, II, C-E, III, F-K 18b
Reports 1890-91. Parts I-III. 18b

- NEW YORK [New York] Columbia College.
 School of Mines Quarterly. Vol. XIII, No 4;
 XIV, No. 1. + 19a
- SACRAMENTO [Cal.] State Mining Bureau.
 Annual Report 1884-86, pt II, 87, 88, 89, 90. + 18b
- TUCSON [Arizona] University of Arizona, School of Mines.
 Bulletin, Nos. 1 and 2. + 19a

NON SERIALS.

Pamphlets, 17e.

- COMSTOCK, T. B. The Veins of Southwestern Colorado. Amer.
 Naturalist, 1886, pp. 1063-1044.
- Mining Engineering at the University of Illinois. Trans.
 Amer. Inst. Mining Engineers, 1886, pp. 1-10.
- Oil and Natural Gas in Illinois. Engineers and Sur-
 veyor's Ass. of Ill., 1887.
- Report on the Geology and Mineral Resources of the
 Central Mineral Region of Texas. Bull. Geol. Surv.,
 Texas, 1891. pp. 555-664.
- A Preliminary Report on the Geology of the Central
 Mineral Region of Texas. Ibid., 1890, pp. 239-391.
- EGLSTON, T. Leaching Gold and Silver Ores in the West.
 Amer. Inst. Mining Engineers, 1883.
- FARISH, J. B. On the Ore Deposits of Newman Hill. Trans.
 Colorado Sci. Soc., 1892, pp. 1-16.
- HALE, I. The Present Limitations of the Electric Power in
 Mining. Trans. Colorado Sci. Soc., 1892.

RITTLER, W. H. Report of Mining Engineer of the Stephenson Silver Mining Company in the Organ Range of Mountains near Ft. Fillmore, in the Territory of New Mexico, U. S. 1860.

VOGDEN, A. W. Notes on the Distribution of Iron Ores in the United States.

PEDAGOGY.

NON-SERIALS.

Pamphlets, 30c.

BURGER, A. Ueber die Gliederung der Padagogik Kants. Inaug. Diss. Jena, 1889.

MAENUEL, B. Ueber Abstraktion. Eine psychologisch-padagogische Monographie. Inaug. Diss. Jena, 1890.

MANTEROLA, R. Ensayo sobre una clasificacion de las Ciencias. Mexico, 1884.

MULLER, W. Comenius: Ein Systematiker in der Padagogik. Eine philosophisch-historische Untersuchung. Inaug. Diss. Jena, 1887.

SPAN, PETER. Die Fortbildung der Padagogik Herbarts durch Ziller. Inaug. Diss. Jena, 1889.

PHILOLOGY.

(SEE LANGUAGE AND LITERATURE.)

PHILOSOPHY. (INCLUDING PSYCHOLOGY, ETHICS,
THEOLOGY, ETC.)

NON-SERIALS.

Pamphlets, 30c.

- AVIELLA, G. L'evolution religieuse contemporaine chez les Anglais, les Americains et les Hindous.
- BAHLOW, F. Luthers Stellung zur Philosophie. Inaug. Diss. Jena, 1891.
- BALTZER, A. Spinozas Entwicklungsgang, besonders nach seinen Briefen geschildert. Inaug. Diss. Kiel, 1888.
- BARCHUDARIAN, J. Inwiefern ist Leibniss in der Psychologie ein Vorganger Herbarts. Inaug. Diss. Jena, 1889.
- BAUER, W. Die Psychologischen Grundanschauungen Pestalozzis. Inaug. Diss. Jena, 1889.
- BESKOW, B. E. Samuel Grubbes Empiriska Psychologi. Upsala, 1890.
- BLASS, F. Naturalismus u. Materialismus in Griechenland zu Platon's Zeit. Kiel, 1887.
- Ideale u. materielle Lebensanschauung. Kiel, 1889.
- CASPARI, C. P. Eine Augustin falschlich beilegte Homilia de sacrilegiis. Christiania, 1886.
- CHRISTINNECKE, J. Casualitat u. Entwicklung in der Metaphysic Augustins. I Theil. Inaug. Diss. Jena, 1891.
- DANELL, H. Albrecht Ritschl's Lara om Synden. Publikation Upsala, 1892.
- DIPPE, ALFRED. Untersuchungen uber die Bedeutung der Denkform Idee in der Philosophie und Geschichte. Inaug. Diss. Jena.

- ERHARDT, E. Kritik der Kantischen Antinomienlehre. Inaug. Diss. Jena., 1888.
- ERHARDT, F. Der Satz vom Grunde als Prinzip des Schliessens. Inaug. Diss. Jena., 1891.
- FORSTER, MAX. Beiträge zur Kenntniss des Characters und der Philosophie d'Alemberts. Inaug. Diss. Jena.
- GEORGOV, I. Montaigne als Vertreter des Relativismus in der Moral. Inaug. Diss. Jena., 1889.
- HARSLER, A. Den Kristnes Forhallande till det Materiella Goda enligt nya testamentets lara. Upsala, 1891.
- HISSBACH C. Ist ein durchgehender Gegensatz zwischen Spinoza u. Leibniss vorhanden. Inaug. Diss. Jena., 1889.
- ILGEN, H. Animadversiones ad L. Annæi Senacæ philosophi scripti. Inaug. Diss. Jena., 1889.
- KLOSTERMANN, A. Die Gottesfurcht als Hauptstück der Weisheit. Inaug. Diss. Kiel, 1885.
- KOPPEHL, HERMANN. Die Verwandtschaft Leibnizens mit Thomas v. Aquino in der Lehre vom Bösen. Inaug. Diss. Jena.
- KUSSNER, G. Kritik des Pessimismus. Inaug. Diss. Jena. 1888.
- LEITZ, H. Probleme im Begriff der Gesellschaft bei Auguste Comte im Gesammtzusammenhange seines Systems. Inaug. Diss. Jena, 1891.
- LIEBERMANN, B. Der Zweckbegriff bei Trendelenberg. Inaug. Diss. Jena, 1889.
- LOECK, G. Die Homiliensammlung des Paulus Diakonus die unmittelbare Vorlage des Otfridischen Evangelienbuchs. Inaug. Diss. Kiel, 1890.
- MARBACH, F. Die Psychologie des Firmianus Lactantius. Inaug. Diss. Jena, 1889.

- MAUFF, B. M. Der Religionsphilosophische Standpunkt der Sogenannten Deutschen Theologie v. Meister Eckhart. Inaug. Diss. Jena, 1890.
- McMURRY, F. Herbert Spencer's Erziehungslehre. Inaug. Diss. Jena, 1890.
- MOLSDORF, W. Die Idee des Schönen in der Weltgestaltung bei Thomas von Aquino. Inaug. Diss. Jena, 1891.
- MOOSHERR, THEODOR. A. E. Biedermann nach seiner allgemeinen philosophischen Stellung. Inaug. Diss. Jena, 1893.
- MORGENSTERN, G. Cyprian, Bischof von Carthago, als Philosoph. Inaug. Diss. Jena, 1889.
- MULLER, H. Johannes Clauberg u. seine Stellung im Cartesianismus mit besonderer Berücksichtigung seines Verhältnisses zu der Occasionalistischen Theorie. Inaug. Diss. Jena, 1891.
- NICOLAI, W. Ist der Begriff des Schönen bei Kant Consequent Entwickelt. Inaug. Diss. Kiel, 1889.
- NITZSCH, F. Luther u. Aristoteles. Kiel, 1883.
- NORSTROM, V. Grundfragen af. Herbert Spencer's Sedelara. Inaug. Diss., 1890.
- RENKAUF, A. Philosophische Begründung des Lehrplans des Evangelischen Religionsunterrichts an Höhern Schulen. Inaug. Diss. Jena, 1892.
- RIEDEL, O. Die Monadologischen Bestimmungen in Kants Lehre vom Ding an sich. Inaug. Diss. Kiel, 1884.
- ROSNY, L. La Religion des Japonais.
- SCHOEBEL, C. L'ame Humaine.
- SCHRECKER, E. Der Religionsbegriff bei Schleiermacher u. seinem namhaftesten Nachfolgern. Inaug. Diss. Jena, 1880.

- SCHWABE, G. Fichte's u. Schopenhauer's Lehre vom Willen mit ihren Konsequenzen für Weltbegreifung u. Lebensführung. Inaug. Diss. Jena, 1887.
- SCHWARZ, H. Die Leibniz'sche Philosophie aufgefasst als Widerlegung des Materialismus. Inaug. Diss. Jena, 1888.
- STEUER, CARL WILIBALD. Die Gottes- und Logoslehre des Tatian mit ihren Berührungen in der griechischen Philosophie. Inaug. Diss. Jena,
- STAVE, E. Om Aposteln Pauli Förhållande till Jesu Historiska lif och lära. Upsala, 1889.
- STRASOSKY, H. Jacob Friedrich Fries als Kritiker der Kant'schen Erkenntnistheorie. Inaug. Diss. Jena, 1891.
- TEMMING, E. Beitrag zur Darstellung und Kritik der moralischen Bildungslehre Kant's. Inaug. Diss. Jena, 1892.
- THOMSEN, H. Die rechtliche Willensbestimmung. 1882.
- TURIC, GEORG. Der Entschluss in dem Willensprozesse, aus dem Gesichtspunkt von Herbarts metaphysik und Psychologie erörtert. Inaug. Diss. Jena.
- VANNERUS, A. Om Erfarenheten ett Kännskapsteoretiskt Studieförsök. Stockholm, 1890.
- VEECK, O. Darstellung u. Erörterung der religionsphilosophischen Grundanschauungen Trendelenburgs. Inaug. Diss. Jena, 1888.
- WERNER, J. Hegels Offenbarungsbegriff. Inaug. Diss. Jena, 1887.
- WERNICK, GEORG. Der Begriff der Materie bei Leibniz in seiner Entwicklung und in seinen historischen Beziehungen. Inaug. Diss. Jena, 1893.
- WILLE, B. Der Phanomenalismus des Thomas Hobbes. Inaug. Diss. Kiel, 1888.

PHONETICS.

NON-SERIALS.

Pamphlets, 30b.

- BIERWIRTH, H. C. Die Vocale der Mundart v. Meinersen. Inaug. Diss. Jena, 1890.
- DITTMAR, E. Die Blankenheimer Mundart. Inaug. Diss. Jena, 1891.
- GOERKE, R. Die Sprache des Raoul de Cambrai, eine Lautuntersuchung. Inaug. Diss. Kiel, 1887.
- GUNTHER, G. Ueber den Wortaccent bei Spenser. Inaug. Diss. Jena, 1889.
- HEIBEY, H. Die Laute der Mundart v. Borssum. Inaug. Diss. Jena, 1891.
- HEUMANN, F. Consonantismus des Gascognischen bis zum Ende des dreizehnten Jahrhunderts. Inaug. Diss. Jena, 1888.
- KEFERSTEIN, G. Der Lautstand. Inaug. Diss. Jena, 1888.
- LEIDOLF, J. Die Naunheimer Mundart. Inaug. Diss. Jena, 1891.
- MARTENS, W. Ueber des Verhalten v. Vocalen u. Dyphthongen in gesprochenen Worten. Inaug. Diss. Kiel, 1888.
- SALGE, E. Der Vocalismus in den Gedichten des Earl of Surrey. Inaug. Diss. Jena, 1887.

PHYSICS.

NON-SERIALS.

Pamphlets, 21b.

- ACKERMANN, K. Bestimmung der erdmagnetischen Inklination von Kassel.
- BALL, R. S. Extension of the Theory of Screws to the Dynamics of any Material System. Trans. of Royal Irish Academy, vol. XXVIII, No. 7, pp. 99-136.
- BJERKEN, P. Nagra Undersokningar ofver Accidentell Dubbelbrytning hos Gelatinosa Aemnen. Upsala, 1890.
- BOAS, F. Beitrage zur Erkenntniss der Farbe des Wassers. Inaug. Diss. Kiel, 1881.
- BROGAN, H. H. Das magnetische Feld im physikalischen Laboratorium und die erdmagnetischen Constanten von Strassburg. Inaug. Diss. Strassburg, 1892.
- BURNETT, S. M. Refraction in the principal Meridians of a Triaxial Ellipsoid, with Remarks on the Correction of Astigmatism by Cylindrical Glasses and an Historical Note on Corneal Astigmatism. Archives of Ophthalmology, vol. XII, No. 1.
- CLASSEN, J. Beobachtungen uber die spezifische Warme der flussigen Schwefels. Inaug. Diss. Hamburg, 1889.
- DORN, E. Vorschlage zur gesetzlichen Bestimmungen uber elektrische Maasseinheiten entworfen durch das Curatorium der Physikalisch-Technischen Reichsanstalt. Berlin, 1893.
- EICHORN, W. Abhangigkeit der Warmeleitung der Gase von der Temperatur. Inaug. Diss. Jena, 1889.

- FARNSTEINER, KARL. Ueber die Einwirkung einiger anorganischen Salze auf das optische Drehungsvermogen des Rohrzuckers. Inaug. Diss. Jena, 1890.
- FRAZER, P. The Application of Composite Photography to Handwriting and Especially to Signatures.
- GERBER, OTTO. Ueber die Zusammensetzung des Dampfes von Klussigkeitsgemischen. Inaug. Diss. Jena.
- GLEICHEN, A. Beitrag zur Theorie der Brechung v. Strahlensystemen. Inaug. Diss. Kiel.
- GRIMPEN, A. Ein Beitrag zur Theorie der durch eine kreisformige Oeffnung erzeugten Beugungserscheinungen. Inaug. Diss. Kiel, 1890.
- GROSS, G. Theoretische u. experimentelle Beitrage zur Diffusion v. Gasen und Dampfen. Inaug. Diss. 1889.
- GROSSE, W. Ueber Polarisationsprismen. Inaug. Diss. 1886.
- HAGSTROM, K. L. Jamforelse mellan Angstroms och Neumanns Metoder for Bestamning Ledningsformaga for Varme. Upsala, 1891.
- HARKNESS, W. M. On the Progress of Science as Exemplified in the Art of Weighing and Measuring. Washington, 1888.
- HENNEBERG, H. Ueber das Warmeleitungsvermogen der Mischungen von Aethylalkohol u. Wasser. Inaug. Diss. Wien, 1888.
- HERINGA, P. M. Considerations sur la Theorie des Phenomenes Capillaires. Archives Nierlandaises des Sciences Exactes et Naturelles, Vol. XIII. 10c.
- JONAS, V. Photometrische Bestimmung der Absorptionsspektra roter u. blauer Blutfarbstoffe. Inaug. Diss. Kiel, 1887.
- HOFKER, HINRICH. Ueber die Warmeleitung der Dampfe von Aminbasen. Inaug. Diss. Jena.

- JUHLIN, J. Bestämning af Vattenaugans Maximispanstighet ofver is mellan 0° och -50° C. samt ofver vatten mellan $+20^{\circ}$ och -13° C. Upsala, 1891.
- KALLENBERG, O. Ueber die Kohasion der Gemische v. Athylalkohol, Propylalkohol u. Ameisensaure mit Wasser u. deren Beziehung zur Dampfspannung. Inaug. Diss. Jena, 1890.
- KARSTEN, G. Die internationale General-Konferenz fur Maass und Gewicht in Paris 1889. Kiel, 1890.
- KOCH, R. Beitrag zur Diffusion von Gasen und Dampfen. Inaug. Diss. Jena, 1892.
- KORSELT, E. Untersuchungen uber das Gesetz der Temperaturabnahme in der Verticalen, auf Grund verschiedener Formeln zur barometrischen Hohenmessung. Inaug. Diss. Jena, 1890.
- KUGEL, M. Ueber die elektromotorische Wirkung des Broms. Inaug. Diss. Jena, 1889.
- LAAS, M. Ueber den Einfluss der Luft auf den Widerstand des Quecksilbers. Inaug. Diss. Strassburg, 1892.
- LADENBURG, A. Die komischen Consequenzen der Spectralanalyse. Kiel, 1884.
- LIEBIG, G. A. On the Electrostatic Force required to produce Sparks in Air and other Gases. Philosophical Magazine, 1887, pp. 106-113, pl. II.
- LEBEDEW, P. Ueber Messungen der Dielectricitatsconstanten der Dampfe u. uber die Mossotti-Clausiusse Theorie der Dielectrica. Inaug. Diss. Strassburg, 1891.
- LUDELING, G. Erdmagnetische Messungen im physikalischen Institut der Universitat Kiel. Inaug. Diss. Kiel, 1891.
- MILLS, SIMEON. Force. Madison, 1893.
- NORDMANN, P. Ueber eine neue Methode zum Messen des Verbrauchs an elektrischer Energie. Inaug. Diss. Berlin, 1888.

- SCHONBERG, P. Ueber die Wärmeleitung u. ihre Abhängigkeit v. der Temperatur in den Dämpfen v. Benzol u. Schwefelkohlenstoff. Inaug. Diss. Jena, 1890.
- SCHULTZE, ARTHUR. Ueber die Bewegung der Wärme in einem homogenen rechtwinkligen Parallelepipedon. Inaug. Diss, Kiel, 1887.
- SIMONSON, E. A. Photometrische u. elektrische Untersuchungen Geissler'scher mit Atmosphärischer Luft gefüllter Rohren. Inaug. Diss. Kiel, 1892.
- SOMMERFELD, ARNOLD. Die Willkürlichen Functionen in der Mathematischen Physik. Inaug. Diss. Königsberg, 1891.
- TARLETON, F. A. On some Deductions from M'Cullagh's Lectures on Rotation. Trans. of Royal Irish Academy. vol. XXVIII, no. X, pp. 185-196.
- THOMPSON, J. O. Ueber das Gesetz der elastischen Dehnung. Inaug. Diss. Strassburg, 1891.
- TIMBERG, G. Om temperaturens inflytande på några vatskors Kapillaritetskonstanter. Upsala, 1891.
- VICTORIAN INSTITUTE OF ENGINEERS. Rules for Electrical Installations.
- WALTER, B. Ueber die lichtverzögernde Kraft gelöster Salzmoleküle u. ein Verfahren zur genaueren Bestimmung von Brechungsexponenten. Inaug. Diss. Jena, 1891.
- ZAHN, G. H. Ueber die Vorgänge an der Uebergangsstelle eines elektrischen Stromes zwischen Elektrolyten in verschiedenen konzentrierten Lösungen. Inaug. Diss. Strassburg, 1892.

PHYSIOLOGY.

NON-SERIALS.

Pamphlets, 22d.

- ALMKVIST, A. Om Upptackten af Blodomloppet, V och VI
Publication Upsala, 1892.
- DANIELSSON, O. A. Om Upptackten af Blodomloppet, IV
Publication Upsala, 1891.
- HAUGHTON, S. The Principle of Least Action in Nature Illus-
trated by Animal Mechanics. London, 1871.
- HJARNE, H. G. Om Upptackten af Blodomloppet, I. Publica-
tion Upsala, 1889.
- HYATT, A. The Larval Theory of the Origin of Cellular Tissue.
Proc. Bost. Soc. Nat. Hist., vol. XXII, p. 262.
- Abstract of Larval Theory of Origin of Tissue. Amer.
Jour. Sci., vol. XXXI, pp. 332-347.
- MORNER, C. T. Undersokning af Proteinamnena i ogats Ljus-
brytande Medier. Publication Upsala, 1892.
- MOTTA, E. A. Elementos de Histologia Geral e Histophysio-
logia. Lisbon.
- MULLER, J. W. Transfusion und Plethora. Christiania, 1875.
- NORDLUNG, G. A. Studier over Framre Bukvaggens Fascior
och Aponevroser hos Menniskan. Publication Upsala,
1891.
- ROBINSKI, S. Zur Kenntniss der Augenlinse und deren Unter-
suchungsmethoden. Berlin, 1883.
- ROWELL, G. A. On the Beneficent Distribution of the Sense of
Pain. London, 1862.

TRYGGER, E., AND FALK, M. Om Upptackten af Blodomloppet.
Publication Upsala, 1889.

WILDER, B. G. Paronymy versus Heteronymy as Neuronymic
Principles. Jour. of Nervous and Mental Disease, vol.
XII, pp. 1-21.

STATISTICS.

SERIALS.

- ALBANY [New York] Annual Report of Quartermaster
General of State of N. Y. for year 1864. 28d
- BUDAPEST [Austria] Statistisches Bureau der Hauptstadt
Budapest. (Fovaros Statisztikai Hivataland
Kozlemenyei.) Vols. XXI-XXIV. + 24b
- BUENOS AYRES [Argentine Republic] Annuaire Statistique
de la Province de Buenos Aires.
Annee 8. 27d
- HELSINGFORS [Finland] Finlands officiela Statistik.
Aren, 1846-1865. 20c
- MADISON [Wisconsin] Annual Report of the Commission-
ers of Fisheries of State of Wis., 1877. 28d
- Annual Report of Secretary of State of the state of
Wisconsin, 1875-77. 28c
- State Board of Charities and Reform.
Annual Report, 1879-1880. 28e
- Report of the State Board of Health, 1884, 1887. 28a
- Journal of House of Representatives, first session of
the third Legislative Assembly of Wisconsin,
1841. 28e

<i>Statistics—Serials.</i>	199
NASHVILLE [Tennessee] State Board of Health. Bulletin, Vols. VI, VII, VIII, Nos. 1-4.	28c
ROME [Italy] Ministero di Agricoltura, Industria e Commercio. Relazione sul Servizio Minerario nel 1882.	15b
SPRINGFIELD [Illinois] Report of Railroad and Warehouse Commission for years 1872-1873.	28c
SIDNEY [N. S. Wales] Melbourne Centennial International Exhibition, 1888.	15e
N. S. Wales Mineral Court Catalogue of Exhibits.	15e
WASHINGTON [D. C.] Treasury Department. Bureau of Statistics. Quarterly Report of Chief. 1875, No. 4, 1876.	28e
— The French Universal Exhibition of 1867.	28b
— Report of Yellowstone National Park, 1877.	28b
— Report of London and Paris International Exhibitions of 1862 and 1867.	28b
— Special Report of Immigration, 1872.	29b
— Annual Report of Board of Visitors to U. S. Military Academy for 1885.	29b
— Finance Report. 1873, 1876.	28a
— Annual Report of Chief of Bureau of Statistics for year 1876, pts. 1-2.	28c
— A Report of the Commercial Relations of the U. S. with Foreign Countries in 1875.	28a
— Population and Resources of Alaska, 1881.	28a
— Report of Commissioner of Education for years 1871, 74, 75.	28b

- WASHINGTON, [D. C.]—continued. Department of State.
 Message and Documents, 1867, 1869, 1876, 28b
- Department of Interior.
 Ninth Census, Vols. I-III (with Compendium). 24c
 Tenth Census, Vols. I-IV, VI-XXII. 24cde
 Report of Commissioner of General Land Office,
 1870-71. 28d
- International Exhibit, 1876.
 Classification of the Collection to Illustrate the
 Animal Resources of U. S. 28d
- U. S. Fish Commission.
 Report, 1881. 28d
- U. S. Commission of Fish and Fisheries.
 The Fishery Industries of U. S., Section 1. His-
 tory of Aquatic Animals, Text. 28d
- Smithsonian Institution.
 List of Correspondents, 1882; Corrected to Jan-
 uary, 1883. 28e

NON-SERIALS.

Pamphlets, 24a.

- BONSEN, L. Schiffs- Tonnen- u. Personenfrequenz auf den
 atlantischen Ozean. Inaug. Diss. Kiel, 1890.
- BOOTHBY, J. Statistical Sketch of South Australia. London,
 1876. 15e
- COGHLAN, T. A. A Statistical Account the the Seven Colonies
 of Australia. Sidney, 1892. 24a
- KNAUER, T. Untersuchung uber den Marktpreis des Heues u.
 dessen Verwendbarkeit zu landwirtschaftlichen Veran-
 schlagungen. Inaug. Diss. Jena, 1889.
- NAPP, R. The Argentine Republic. Buenos Ayres. 1876. 27d

- KUSSAKA, J. F. Das japanische Geldwesen. Inaug. Diss. Jena, 1890.
- PICKARD, J. L. Report of Common Schools of State of Wisconsin 1861. Madison, 1861. 26b
- ROBINSON, C. Official Catalogue of the Natural and Industrial Products of N. S. Wales. Sidney, 1876. 15e
- New South Wales. Its Progress and Resources. Sidney, 1876. 15e
- New South Wales, the Oldest and Richest of the Australian Colonies. Sidney, 1873. 15e
- SEELHORST, C. VON. Der Roggen als Wertmass fur landwirtschaftliche Berechnungen. Inaug. Diss. Jena., 1888.
- TRAGER, E. Die Volksdichtigkeit Niederschlesiens. Inaug. Diss. Kiel., 1888.
- WELLS, W. Water Power of Maine. Augusta, 1869.

ZOOLOGY.

SERIALS.

- AMSTERDAM [Holland] Koninklijk Zoologisch Genootschap
Natura Artis Magistra.
Feest Nummer. Bijdragen tot de Dierkunde. 22c
- BRESLAU [Germany] Zeitschrift fur Entomologie.
Neue Folge, Hefts 1-18 (1870-92) +
Entomologische Miscellan. 22
- BRUSSELS [Belgium] Societe royale Malacologique de Belgique.
Proces-Verbaux des Seances, Vols. XI, pts. 1-7;
XII, 8-12; XIII, XIV, XV, 8-12; XVI-
XIX, XX, 1-6. + 25a
Annales, Vols. XXI-XXV + 22a

- BUDAPEST [Hungary] Termesztudományi Füzetek (A periodical of zoology, botany, mineralogy and geology besides a review for abroad.)
Vol. XV (1892) Nos. 3, 4. + 19b
- CAMBRIDGE [Mass.] Nuttall Ornithological Club.
Journal, Vol. 4, Jan. 1879. 22a
- GRANVILLE [Ohio] Journal of Comparative Neurology
(Edited by C. L. Herrick, Granville, Ohio.)
Vols. I, II pts. 1-3. + 22a
- NEW YORK [N. Y.] Am. Ornithologists Club.
The Auk. 1889-92. Vols. VI-IX, parts 1-2. + 22a
- PHILADELPHIA [Penn.] Zoological Society.
Annual Report. 1879-81, 83, 85-90. + 22b
- ZÜRICH-HÖTTINGEN [Switzerland] International Entomological Society (Societas Entomologica.)
Jahrgang VIII, Nos. 3, 6. (1893.) + 31d

NON-SERIALS.

Pamphlets. 29e.

- ALLEN, J. A. The North American Species of the Genus *Colaptes*, considered with Special Reference to the Relationships of *C. auratus* and *C. cafer*. Amer. Museum of Nat. Hist., vol. IV, No. 1, pp. 21-44.
- ANTIPA, G. Die Lucernariden der Bremer Expedition nach Ostspitzenbergen im Jahre 1889. Inaug. Diss. Jena, 1891.
- APSTEIN, C. Bau und Function der Spinndrüsen der Araneida. Inaug. Diss. Kiel, 1889.
- AVERILL, C. K. List of Birds Found in the Vicinity of Bridgeport, Conn. Bridgeport Sci. Soc.
- BAARS, H. Les Pêches de la Norwege. Paris, 1867.

- BEYER, O. W. Der Giftapparat v. *Formica rufa*, ein reducirtes Organ. Inaug. Diss. Jena, 1890.
- BILLET, A. Contribution a l'Etude de la Morphologie et du Developpement des Bacteriacees. Bull. Scientifique de la France et de la Belgique, 1890.
- BOGERT, A. Ueber die Dictyochiden insbesondere uber *Dis-terphanus Speculum* sowie Studien an Phæodarien. Inaug. Diss. Kiel, 1891.
- BOLLMAN, C. H. AND EVERMANN, B. W. Fishes from the Monongahela River.
- BORCKERT, H. Anatomisch-physiologische Untersuchung der Haftscheibe v. *Cyclopterus lumpus* L. Inaug. Diss. Kiel, 1889.
- BORGERT, H. Die Hautdrusen der Tracheaten. Inaug. Diss. Jena, 1891.
- BRAUER, F. Offenes Schreiben als Antwort auf Herrn Baron Osten-Sacken's "Critical Review" Meiner Arbeit uber die Notacanthen.
- BRONN, Dr. H. G. Klassen und Ordnungen des Thier-Reichs, Vol. V, Arthropoda. Leipzig and Heidelberg, 1874. 22c.
- BROOKS, W. K. Note on the Ratio between Men and Women. Johns Hopkins University Circulars, vol, VII, No. 63, p. 30.
- BROWN, N. C. A catalogue of the Birds Known to Occur in the Vicinity of Portland, Maine. Proc. of Portland Soc. Nat. Hist., 1882.
- CLAUS, C. Zur Erwahrung der Ergebnisse meiner Untersuchungen uber *Charybdea* als abwehr gegen den Haeckelismus.
- COBB, N. A. Beitrage zur Anatomie u. Outogonie der Wemato-den. Inaug. Diss. Jena, 1888.

- COLLETT, R. Om 6 for Norges Fauna nye Fugle fundne i 1887-1889. Christiania, 1890.
- Rugekasser for vore nyttige Smaafugle, deres Indretning og Boboere. Christiania, 1870.
- COLLIN, A. Notiz uber Guatthostoma Hispidum Fedsch. aus dem Rinde. Zeitschrift fur Fleish-u. Milch-hygiene, 1893.
- Ueber die Regenwurmer der Umgegend von Berlin. Naturwissenschaftliche Wochenschrift, No. 43, p. 433.
- Criodilus lacuum Hoffm. Inaug. Diss. Berlin, 1888.
- CONKLIN, W. A. Report of the Directors of the Central Park Menagerie for 1879.
- COUES, E. Abstract of the Results of a study of the Genera Geomys and Thomomys.
- DAHL, F. Beitrage zur Kenntniss des Baues und der Functionen der Insektenbeine. Inaug. Diss. Kiel, 1884.
- DIMMOCK, A. K. Sexual Attractions in Prionus. Psyche, vol. IV, No. 120, p. 160.
- DREYER, F. Die Theorie der Biokrystallisation im Allgemeinen u. die Skelettbildung der Polycystinen im Besonderen. Inaug. Diss. Jena, 1890.
- DRIESCH, H. Tektonische Studien an Hydroidpolypen. Die Campanulariden und Sertulariden. Inaug. Diss. Jena, 1889.
- DUBOIS, M. A. Note zur un Coccyzus tue en Belgique. Proc. Academie Royale de Belgique, vol. XXXIV, No. 1.
- Remarques Morphologiques sur les especes du sousgenre Xanthoura. Ibid., vol. XXXVIII, Nos. 9-10.
- EHRENBAUM, E. Untersuchungen uber die Struktur und Bildung der Schale der in der Kieler Bucht haufig Vorkommenden Muscheln. Inaug. Diss. Kiel, 1884.
- ELLIOTT, H. W. Report of the Seal Islands of Alaska.

- EVERMANN, B. W. The Wood Ibis in Indiana. *The Auk*, vol. VI, no. 2, pp. 186-187.
- Bird Migration. *Popular Sci. Monthly*, 1887, pp. 803-810.
- The Yellow-Billed Magpie. *Amer. Naturalist*, 1886, pp. 607-611.
- Birds of Carroll County, Indiana. *The Auk*, Oct. 1888 and Jan. 1889.
- AND FORDICE, M. W. List of Fishes Collected in Harvey and Cowley Counties, Kansas.
- FAXON, W. On Some Crustacean Deformities. *Bull. Mus. Comparative Zoology*, vol. VIII, no. 13, pp. 253-276, plates 1-2.
- On Some young Stages in the Development of Hippa, Porcellana, and Pinnixa. *Ibid.*, vol. V, no. 11, pp. 253-268, pl. 1-5.
- FEWKES, J. W. On the Development of Agalma. *Ibid.*, vol. XI, no. 11, pp. 239-275, pl. 1-4.
- FORBES, S. A. An American Terrestrial Leech. *Illinois State Laboratory of Natural History*, 1890, pp. 119-122.
- Studies on the Chinch Bug.
- FRESE, W. Anatomisch-histologische Untersuchung v. Membranipora pilosa L. nebst einer Beschreibung der in der Ostsee gefundenen Bryozoen. *Inaug. Diss. Kiel*, 1888.
- GARMAN, H. Animals of the Waters of the Mississippi Bottoms near Quincy, Ill. Two copies.
- GARMAN, S. The Rattle of the Rattlesnake. *Bull. Mus. Comparative Zoology Harvard College*, vol. XIII, no. 9, pp. 259-267, pls. 1 and 2.

- GRANT, U. S. Conchological Notes. Fourteenth (1885) Annual Report of the Geol. and Nat. Hist. Survey of Minnesota.
- Notes on the Molluscan Fauna of Minnesota. Sixteenth (1887) Annual Report of the Geol. and Nat. History Survey of Minnesota.
- GRENTZENBERG, M. Die Spongienfauna der Ostsee. Inaug. Diss. Kiel, 1891.
- GUNTHER, A. A Guide to the Gould Collection of Humming Birds. British Museum of Nat. History. 19c.
- Zoological Collections of H. M. S. Alert. Ibid. 19c.
- Guide to the Gallery of Reptiles and Fishes; Shell and Starfish; Mammalia. Ibid. 19c.
- HAHN, E. Die Geographische Verbreitung der Coprophagen Lamellicornier. Inaug. Diss., 1887.
- HASELOFF, B. Ueber den Krystallstiel der Muscheln nach Untersuchungen verschiedener Arten der Kieler Bucht. Inaug. Diss. Kiel, 1888.
- HEMPHILL, H. Catalogue of North American Shells.
- HENSHAW, S. List of the Coleoptera of America North of Mexico.
- HERBST, C. Anatomische Untersuchungen an Scutigera coleop-
tera. Inaug. Diss. Jena, 1889.
- HYATT, A. Revision of North American Poriferae with Remarks upon Foreign Species, pts. 1-2. Memoirs Bost. Soc. Nat. Hist., vol. II, pt. 4.
- Larval Theory of the Origin of Cellular Tissue. Proc. Bost. Soc. Nat. Hist., vol. XXXIII, pp. 45-163.
- Sponges Considered as a Distinct Sub-Kingdom of Animals. Ibid., vol. XIX, pp. 12-17.

- Genetic Relations of *Stephanoceras*. *Ibid.*, vol. XVIII, pp. 380-401.
- Values in Classification of the Stages of Growth and Decline with Proposition for a New Nomenclature. Two Copies. *Amer. Naturalist*, 1888, pp. 872-884.
- Observations on Polyzoa, sub-order Phylactolamata.
- Genetic Relations of the Angulatidae. *Proc. Bost. Soc. Nat. Hist.*, vol. XVII, pp. 15-33.
- JACOBI, R. Anatomisch-Histologische Untersuchung der Polydoren der Kieler Bucht. *Inaug. Diss. Kiel*, 1883.
- JOHANNESSEN, AXAL. Difteriens Forekomst i Norge. *Christiania Videnskabs-Selskabs Forhandling*, 1888, No. 1. 22c.
- JORDAN, D. S. Contributions to North American Ichthyology, No. 1. *Bull. U. S. National Museum*, 1877.
- JUEL, H. O. Beiträge zur Anatomie der Trematodengattung *apoblema* (Dujard). *Upsala*, 1889.
- JURINAE, A. E. Ein Beitrag zur Kenntniss der Fauna des Kroatischen Karstes u. seiner unterirdischen Höhlen. *Inaug. Diss. Jena*, 1888.
- KINGSLEY, J. S. Carcinological Notes. *Bull. Essex Institute*, vol. XIV, p. 105.
- Some Points in the Development of *Molgula Manhattanensis*. *Boston Soc. of Nat. Hist.*, vol. XXI, pp. 441-451.
- Problems for Zoologists. *Amer. Naturalist*, 1882, pp. 389-391.
- KLOTZ, J. Beitrag zur Entwicklungsgeschichte u. Anatomie des Geschlechtsapparates v. *Lymnaens*. *Inaug. Diss. Jena*, 1888.

- KOEHLER, R. Contribution a l'Etude des Enteropneustes. Communiqués a la Société des Sciences de Nancy, 1886, pp. 139-190, plates 1-6.
- KUKENTHAL, W. Ueber das Nervensystem der Opheliaceen. Jena, 1887.
- KUNZ, G. F. The Lower Forms of Life Dredged by the *Talisman*. *Science*, 1884, p. 171.
- LANGHOFER, A. Beiträge zur Kenntniss der Mundtheile der Dipteren. Inaug. Diss. Jena, 1888.
- LAWRENCE, G. M. Birds of Southwestern Mexico Collected by Francis E. Sumichrast. Bull. No. 4, U. S. National Museum, 1875.
- LEHMAN, O. Beiträge zur Frage v. der Homologie der Segmentalorgane u. Ausführungsgänge der Geschlechtsproducte bei den Oligochaeten. Inaug. Diss. Jena, 1887.
- LEICHMANN, G. Ueber die Brutpflege bei den Isopoden. Inaug. Diss. Königsberg, 1891.
- LEON, U. Beiträge zur Kenntnis der Mundtheile der Hemipteren. Inaug. Diss. Jena, 1887.
- LOHMANN, H. Die Unterfamilie der Halacaridæ Murr. u. die Meeresmilben der Ostsee. Inaug. Diss. Jena, 1888.
- LOIMBERG, E. Anatomische Studien über Skandinavische Cestoden. Inaug. Diss. Upsala, 1891.
- MACALISTER, A. An Introduction to Animal Morphology and Systematic Zoology. London, 1876. 22.
- MALME, G. O. Studien über das Gehirn der Knochenfische. Inaug. Diss. Stockholm, 1892. 22.
- MARTIN, H. N. A Correction of Certain Statements published in the "*Zoophilist*," also a Castigation and an Appeal.

- MANN, W. Ueber Scoloplos Arminger O. F. Miller.—Beitrag zur Kenntniss der Anatomie u. Histologie der Anneliden. Inaug. Diss. Kiel, 1881.
- MEISSNER, M. Beitrage zur Ernahrungsphysiologie der Protozoen. Inaug. Diss. Berlin, 1888.
- MOSELY, H. W. On the Structure and Relations of the Alcyonarian *Helioptera caerulea* with some account of the Anatomy of a Species of *Sarcophyton*.
- NELSON, WM., AND TAYLOR, JOHN W. The Quarterly Journal of Conchology, Vol. I, 1874. 22c.
- OESTLUND, O. W. Synopsis of the Aphididae of Minnesota. Bull. No. 4 of Geol. and Nat. Hist. Survey of Minnesota.
- OSBORN, H. A Partial Catalogue of the Animals of Iowa.
- OSBORN, H. F. AND WORTMAN, J. L. *Artionyx*, a New Genus of Anclyo-poda and Appendix. Bulletin of American Museum of Nat. Hist., Vol. V.
- PECKHAM, G. W. AND E. G. On the Genera of the Family Attidæ. Trans. Wis. Acad. Sci. 1885, pp. 257, 335.
- POPPE, S. A. Die freilebenden Copepoden des Jadabusens. Abhandlungen des naturwissenschaftlichen Vereins zu Bremen. Vol. IX, pp. 167-206.
- RATHBUN, R. Descriptions of new Species of Parasitic Copepods Belonging to the Genera *Trebius* *Perissopus*, and *Lernanthropus*, Proc. U. S. National Museum, 1887, pp. 559-571, pls. 29-35.
- REIGHARD, J. On the Anatomy and Histology of *Anlophorus Vagus*. Proc. of Amer. Academy of Art and Science, vol. XX, pp. 88-106.
- RESLER, A. The Blackburnian Warbler. Trans. Maryland Academy of Sciences, 1892, pp. 203-212.

- RYDER, J. A. On the Development of viviparous osseous Fishes and of the Atlantic Salmon. Proc. U. S. Nat. Museum, 1885, pp. 128-162, pls. 6-12.
- SANDBERG, G. Bemaerkninger til Wallmgrens tydning af Phalaena Noctura Obscura. Christiania, 1891.
- SARS, G. O. Oversigt af Norges Crustaceer med forelobige Bemaerkninger over de nye eller mindre bekjendte Arter. Christiania, 1890
- On Some Remarkable Forms of Animal Life from the Great Deeps of the Norwegian Coast. Christiania, 1872. 22c.
- Carcinologiske Bidrag til Norges Fauna. 22e.
- On some Freshwater Ostracoda and Copepoda raised from Dried Australian Mud. Christiania, 1889.
- On a small Collection of Freshwater Entomostraca. Christiania, 1889.
- Additional Notes on Australian Cladocera raised from dried Mud. Christiania, 1888.
- SAUSURE, M. H. Orthopteres. St. Petersburg, 1874.
- SCHOYEN, W. M. Supplement til H. Siebke's Emmeratio Insectorum Norvegicorum. Christiania, 1889.
- Bidrag til Kunds-Kaben om Norges Hemipter- og Orthopter-Fauna. Christiania, 1889.
- SCHRODER, G. Anatomische-Histologische Untersuchung v. Nereis diversicolor, O. Fr. Mull. Inaug. Diss. Kiel, 1886.
- SEVERIN, F. Untersuchung ueber das Mundepithel bei Sauge-thieren mit Bezug auf Verhornung Regeneration u. Art der Nervenendigung. Inaug. Diss. Kiel, 1885.
- SCHUFELDT, R. W. The Osteology of Amia Calva.

- SIEBKE, H. Enumeratio Insectorum Norwegicorum. Christiania, 1874. 22c.
- Ibid., 1880.
- SMITH, H. L. Report of the Committee on Oculars. Proc. of Amer. Soc. of Microscopists, 1884.
- SMITT, F. A. Kritisk Forteckning ofver de i Reksmuseum Befintlige Salmonider. 22.
- STEARNS, R. E. C. Comments on Mr. Calkin's Marine Shells of Florida.
- STEEN, J. Anatomisch-histologische Untersuchung v. Terebellides Stroeimi M. Sars. Inaug. Diss. Kiel, 1883.
- STEPHENS, G. T. Report on the Progress of Zoology for the year 1870.
- STORCH, W. Knochenuntersuchungen ausgefuhrt am Knochengerust eines Rindes. Inaug. Diss. Jena, 1889.
- SUMICHRAST, F. Coup d'Oeil sur la Distribution Geographique des Reptiles en Mexique.
- SUNDBERG, C. J. G. Undersokningar ofver Mojligheten af Mikrobers Intrangande Genomden Oskadade Tarmslem hinnans Yta. Publication Upsala, 1892.
- SYE, C. G. Beitrage zur Anatomie u. Histologie v. Isera Marina. Inaug. Diss. Kiel, 1887.
- THEOPHILOFF, S. Zur Phylogenie der Tunicaten, Eine Kritische Studie. Inaug. Diss. Jena, 1892.
- TIEDEMANN, F. Zur Kasuistik des primaren Gallenblasenkrebses. Inaug. Diss. Kiel, 1891.
- TRAUTZSCH, H. Beitrag zur Kenntniss der Polynoiden v. Spitzbergen. Inaug. Diss. Jena, 1889.
- VANIOT, R. P. E. Mollusques Recueillis au Sud d'Amiens dans un Rayon de 2 lieues (1876-77). 76 Especies.

WESTHOFF, Fr. Die Kafer Westfalens, IIte Abtheilung
Suppl. Verh. Naturh. Vereins d. preuss. Rheinl. u. Westf.
Jahrgang 38. Bonn, 1882.

WORCESTER, G. W. The Life History of Stentor Coeralens, or
Blue Stentor.

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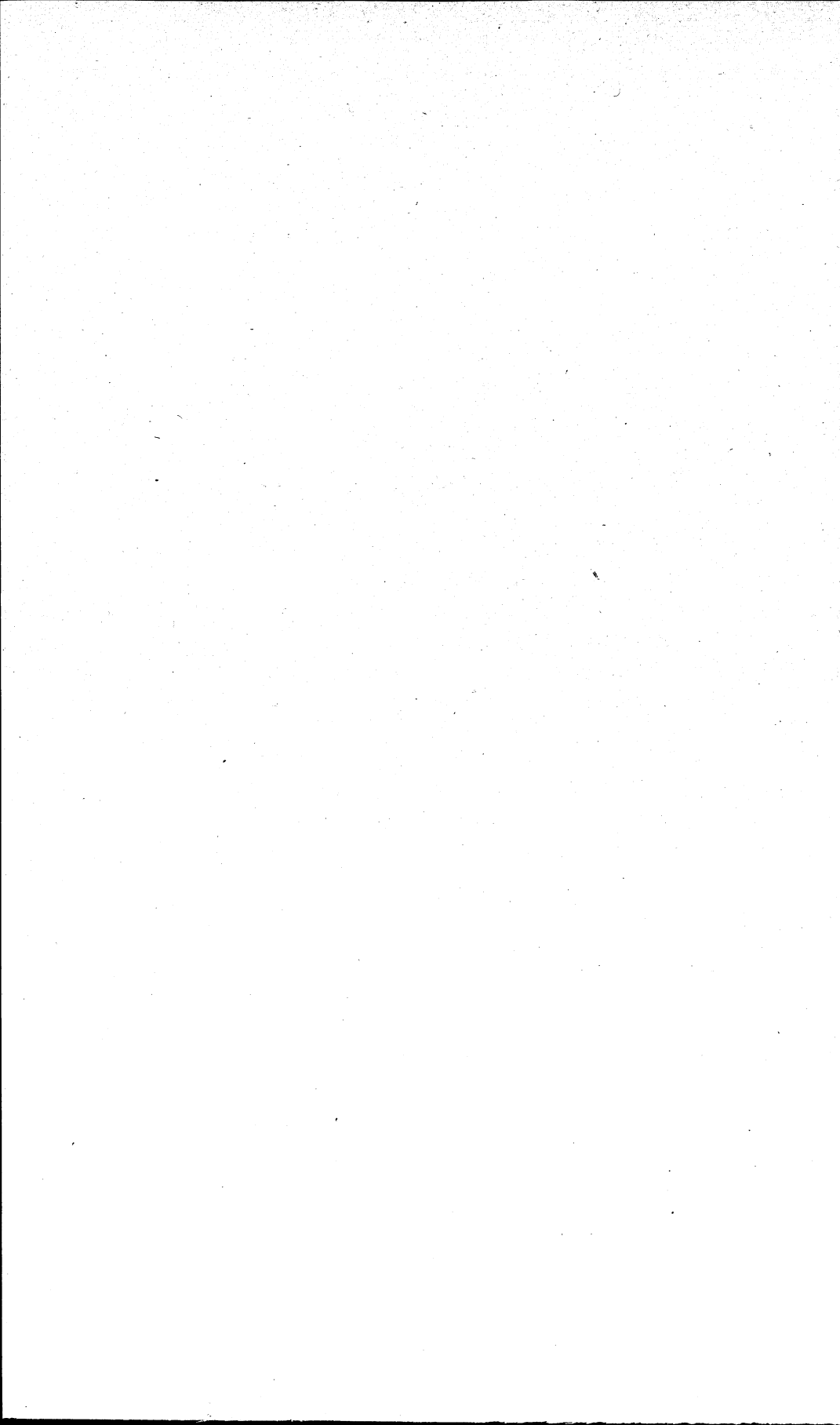
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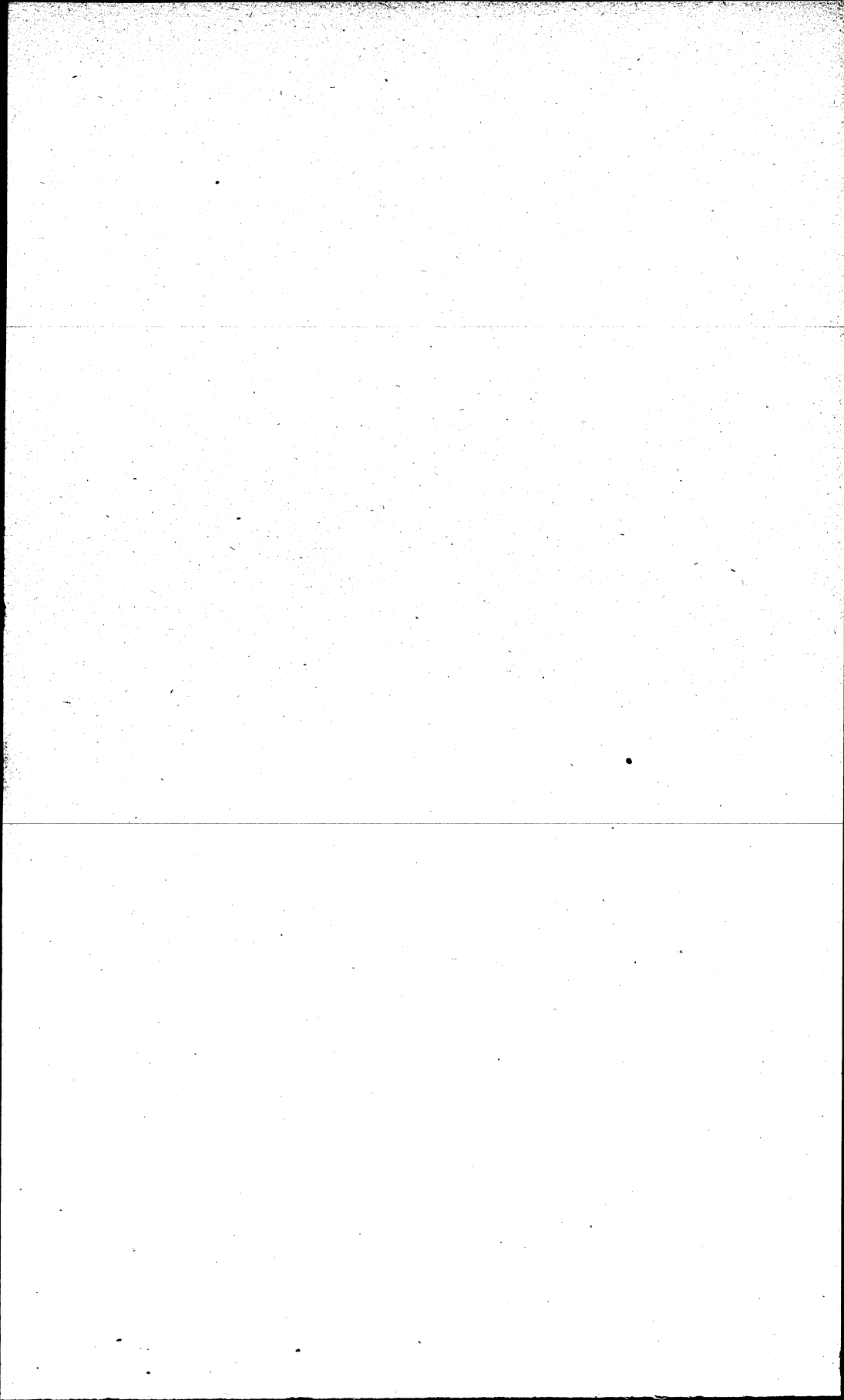
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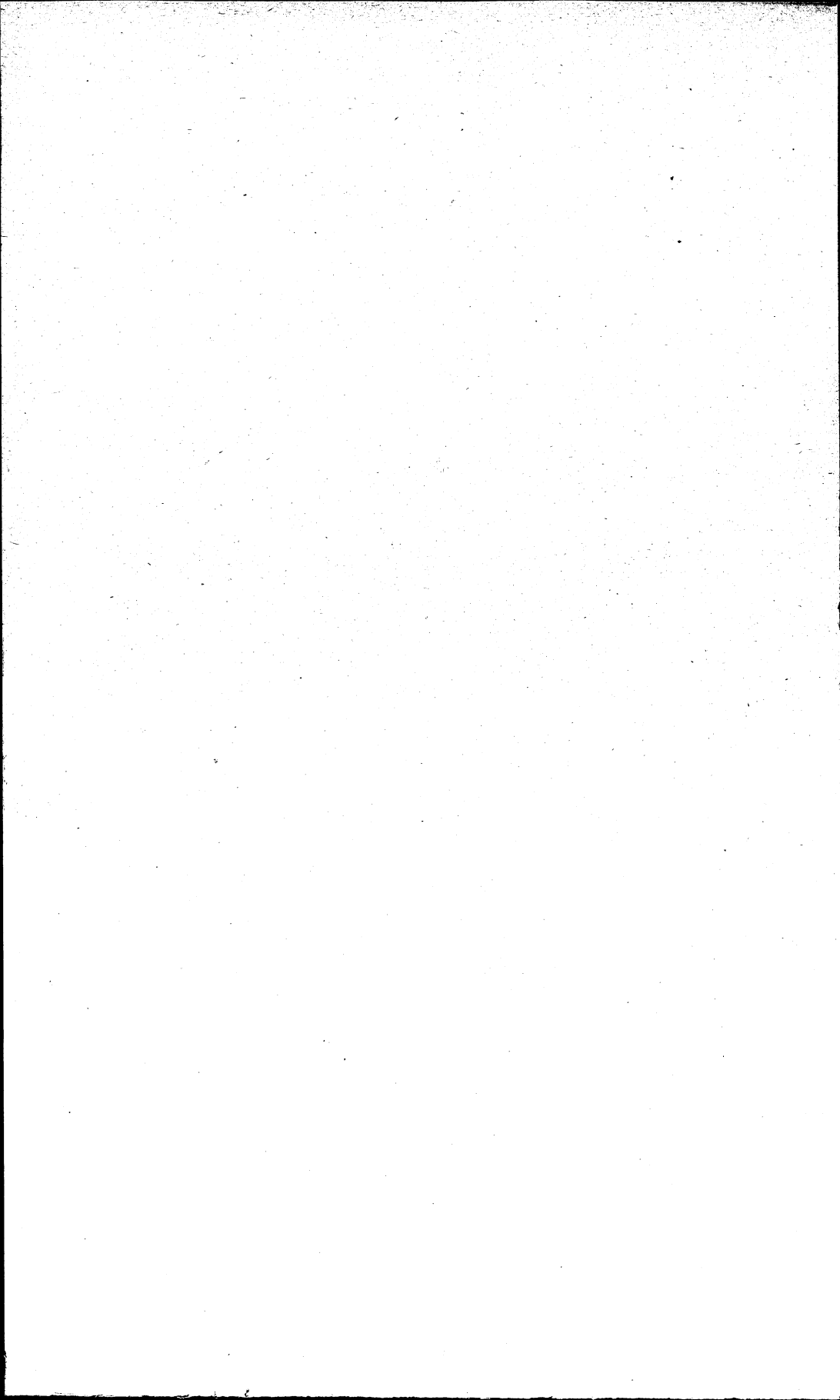
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