by the United States and in charge of officers of the United States, for investigations and researches, under regulations to be prescribed by the said Regents, and as far as shall be mutually agreed upon between the said Regents and the heads of the several executive departments of the Government, the Librarian of Congress, Commissioner of Labor, Commissioner of Fish and Fisheries, and the Secretary of the Smithsonian Institution, with a view of carrying out the policy of Congress, declared in the Joint Resolution of April 12, 1892.

2. That the Regents be requested to ask the general public for gifts of money, to be used in providing buildings, laboratories, equipment and endowments, for purposes of instruction, such instruction to be limited to students who are graduates of properly accredited institutions, or those who are otherwise properly qualified, it being understood that it shall not be the purpose of the Smithsonian Institution to confer degrees of any kind in connection with such instruction.

3. That the Regents be requested to formulate a plan for the appointment of an Advisory Board; the members of said Board to represent the leading educational institutions of the country, with a view to securing the active co-operation of the colleges and universities of the country in carrying on this undertaking.

If, however, it is decided that the Bureau of Education is the best administrative center for this work, then we recommend the following course of action:

1. That the Congress be requested to erect the Bureau of Education into an independent department, on a plane with the Department of Labor, and to provide a salary of not less than $5000 for the Commissioner of Education.

2. That the Congress be requested to provide for an Assistant Commissioner of Education, at a salary of not less than $4000, whose duty it shall be to ascertain and make known what facilities for research exist in the government departments and collections at Washington; to formulate, in connection with the heads of the several departments and the officers in charge of Government collections, rules and regulations under which suitably qualified persons may undertake research in those departments and collections, with a view to carrying out the policy of Congress as declared in the joint resolution approved April 12, 1892; and to exercise general supervision over the persons permitted to undertake such research.

3. That the Department of Education, so organized, be requested to formulate a plan for the appointment of an advisory board, representing the colleges and universities of the country which receive aid from the government or which have not fewer than 25 resident graduate students in any one year, with a view to securing the active co-operation of such colleges and universities in organizing and maintaining the work of research at Washington.

4. That in accordance with a plan to be prepared and adopted by the Department of Education, in consultation with such advisory board or its executive committee, the colleges and universities of the country be asked to give credit, toward the requirements for their higher degrees, for research carried on at Washington under the supervision of the Department of Education.

Under the terms of either of the plans proposed it is assumed that the persons admitted to carry on research will be graduates of a college or university in good standing, or will have had an equivalent training.

Such a bureau of research, whether it be placed under the care of the Smithsonian Institution or under that of the Department of Education—which would supersede the existing Bureau of Education—would be a source of strength to the higher education of the United States and a great advantage to the Government in its work of promoting the progress of science and the useful arts, and in applying the result of scientific investigation to the development of the natural resources of the country, of agriculture, of manufactures, and of commerce.

We regret that our colleague, Dr. J. L. M. Curry, has, through absence from home, been prevented from sharing in the formulation of this report.

Respectfully submitted,

William R. Harper,
Nicholas Murray Butler.

Chicago, Ill.,
Feb. 26, 1900.

ASSOCIATION OF AMERICAN ANATOMISTS.

The Association held its twelfth session December 27 and 28, 1899, at New Haven, Connecticut, in conjunction with the affiliated societies. There were present nine-

teen members:—Blake, Ferris, Gerrish, Herrick, Holmes, Hrdlicka, Huber, Lamb, Mackenzie, Mall, Mellus, Miller, M. B. Moody, R. O. Moody, Minot, Piersol, Tuttle, Shepherd, and Wilder. New members were elected as follows:—R. Tait Mackenzie, B.A., M.D., Demonstrator of Anatomy, McGill University, Montreal, Canada, No. 59 Metcalfe St., Montreal; E. Linden Mellus, M.D., Fellow in Anatomy, Johns Hopkins University, Baltimore, Md., No. 10 East Chase Street, Baltimore; Wm. S. Miller, M.D., Assistant Professor of Vertebrate Anatomy, Wisconsin University, Madison, Wisconsin, 615 Lake Street, Madison; Alexander Primrose, M.B.C.M. (Edin.), M.R.C.S. (Eng.), Professor of Anatomy, University of Toronto, Canada, 100 College Street, Toronto; Richard Dresser Small, A.B, M.D., Instructor in Anatomy, Portland School for Medical Instruction, 606 Congress Street, Portland, Maine. Dr. John Cleland of Glasgow, Scotland, was elected an honorary member. Dr. Frank Baker resigned from the Committee on Anatomical Nomenclature and Dr. H. B. Ferris was appointed to fill the vacancy. The annual dues were increased to five dollars. It was decided to meet as usual with the Congress of American Physicians and Surgeons this spring. The Association voted that members desiring to subscribe for the *Journal of Anatomy and Physiology* could do so through its Secretary at net cost of $5.30; also that the titles of papers to be read at meetings should be accompanied by abstracts of about 150 words each. Officers for the ensuing term were elected:—Dr. George S. Huntington, New York City, President; Dr. F. H. Gerrish, Portland, Me., First Vice-President; Dr. G. C. Huber, University of Michigan, Second Vice-President; Dr. D. S. Lamb, Washington, Secretary and Treasurer; Dr. C. S. Minot, of Boston, member of the Executive Committee in place of Dr. Gerrish, retired.

In the absence of Drs. Huntington and Spitzka, the Committee on Anatomical Nomenclature (Drs. Gerrish, Wilder and Ferris) reported progress and asked the Association to consider, with a view to decisive action at the next session, the following names for constituents of the peripheral nervous system. Where a single term is given it is the one adopted by the B. N. A., and also preferred unanimously by the Committee. Where two terms are used the first is the one in the B. N. A., but this does not imply that it is preferred by the Committee.

Nervi cerebrales vel craniales.

Nervi olfactorii,
Nervus opticus,
" oculomotorius,
" trochlearis,
" trigeminus *vel* trifacialis,
Nervus ophthalmicus,
" maxillaris,
" mandibularis,
Nervus abducens,
" facialis,
" acusticus *vel* auditorius,
" glossopharyngeus,
" vagus,
" accessorius,
" hypoglossus.

Nervi spinales.

Nervi cervicales,
Plexus brachialis,
Nervus musculocutaneus,
" medianus,
" ulnaris,
" radialis.
Nervi thoracales,
" lumbales,
" sacrales,
Nervus coccygeus,
Plexus lumbalis,
" sacralis,
Nervus iliohypogastricus,
" ilioïnguinalis,
" genitofemoralis (genitocruralis),
" obturatorius,
" femoralis (cruralis anterior),
" ischiadicus *vel* sciaticus.

Systema nervorum sympathicum.

Truncus sympathicus,
Ganglia trunci sympathici,
Plexus sympathici,
Ganglia plexuum sympathicorum.

The address of the President, Dr. Wilder, was entitled, 'Historic, ethical and practical considerations respecting the names and numbers of the definitive encephalic segments.' There were presented facts and arguments in favor of maintaining the customary method of enumerating the segments of the brain beginning with the most cephalic or 'anterior,' and in favor of retaining for five of these segments the names, *prosencephalon*, *diencephalon*, *mesencephalon*, *epencephalon* and *metencephalon*, which were adopted or proposed in 1867 by the editors of the seventh edition of 'Quain's Anatomy.' In particular it was shown that the replacement of *metencephalon* by 'myelencephalon' for the last (oblongatal) segment, as done by Huxley and in the B. N. A., is not only unjustifiable on historic and ethical grounds, but practically objectionable because it apparently involves the retention of the lengthy and unrelated terms of the B. N. A., viz: 'myelencephalon,' 'ventriculus quartus,' 'tela chorioidea ventriculi quarti,' 'plexus chorioideus ventriculi quarti,' and 'apertura medialis ventriculi quarti' (foramen Magendii), and the abandonment of the series of correlated single-word terms, *metencephalon*, *metacoelia*, *metatela*, *metaplexus* and *metaporus*. (The address will be published in SCIENCE.)

The following papers were read:

Divisions of cranial bones in man and animals: DR. ALES HRDLICKA, of New York City.

Five classes of divisions are described and demonstrated, namely: (1) results of fractures; (2) normal, partial divisions in definite locations in the bones of the embryos and new-born; (3) anomalous partial divisions consequent upon the formation of a foramen in the ossifying bone; (4) divisions due to a retardation of the union of any of the normal segments of the bones; and (5) anomalous divisions due to an abnormal multiplicity of the centers of ossification. Class (2):—Two of the most prominent and constant of such divisions in man are the parietal incisure of Broca, and a squamous suture situated near the middle of the occipital border of the parietal bone (termed 'parietal suture' by the author). Class (3):—Rare in man, so far as the bones of the cranial vault are concerned, but are common in the human superior maxillæ in connection with the infraorbital foramen; they are very frequent in the parietal and temporal bones in mammals, particularly in the herbivora. Class (5):—Occur generally in the form of sutures dividing the whole bone or separating one of its angles. They are liable to be confounded with the previous and are somewhat allied to the same. These divisions are well known in the human parietal; the author has the records of eighteen new cases, found principally in macaques; one of the specimens presented before the Association shows a bilateral division of the parietal bone in a chimpanzee. In lower mammals these divisions are extremely rare.

A further contribution to the study of the tibia, relative to its shapes (vide last year's Proceedings of the Association): DR. ALES HRDLICKA.

An effort has been made during 1899 to learn the occupations of the subjects whose tibias had been examined. The returns show a great diversity of occupations and even of classes of occupations, and it is plain that if any definite conclusions are to be reached, the investigations must extend over at least another thousand of subjects. The main indications so far are as follows: Inactivity of the lower extremities favors the persistence of the adolescent shape of the tibiæ; considerable activity in the lower limbs especially if of a definite kind, favors a differentiation in the shape of the bones. In the American Indians who were always

great walkers and did otherwise comparatively but little, types two and four of tibiæ prevail. In strong, but also in rachitic, individuals there is an inclination to type 3 of the bones. There was but little occasion to inquire into the influence of heredity on the shape of the tibiæ, nevertheless such influence seems very probable.

The deep fascia: DR. HOLMES, University of Pennsylvania.

The deep fascia is a firm tense membrane of wide extent and complex function. It lines the interior of the abdomen, protects the various orifices, forms ligaments for the organs and a floor for the pelvis, sheathes vessels and muscles and binds muscles into groups, divides regions into spaces and sets off organs by themselves, so that differentiation into fascial compartments means also differentiation into function. The transversalis fascia is a continuation of the fascia lata and forms a fibrous bag for the abdomen continuous posteriorly with the lumbar fascia. It is the real pelvic floor rather than the levator ani muscle. The subdivisions of the muscles of the thigh, leg and foot, and of the axilla, arm, forearm and hand indicate the separate office of each group. In the cervical region the three divisions of investing, pretracheal, and prevertebral, indicate similar conditions; the prevertebral layer being of especial value in conserving the action of the esophagus, larynx and trachea. The especial object of the paper is to direct the attention of the members of the Association to the greater importance of the fascia, and also to maintain that whenever we find its distribution separating the structures, we may regard it as an indication of an equal separation into a distinct function.

The facial expression of fatigue and violent effort: DR. R. TAIT MCKENZIE, McGill University.

In fatigue, as observed in a foot-race of a mile, we see the following changes: The lips are slightly parted, the teeth open, eyes semi-closed, brows contracted, as in mental concentration, the upper half of the orbicularis acting with the corrugator supercilii. As the race proceeds, the lips are drawn down by the depressors and up by the levator proprius and zygomaticus minor. The corrugator acts strongly. As the respiratory need increases, the nostrils are dilated by the levator labii superioris alæque nasi, accentuating the expression of grief. This expression then passes away and the face becomes apathetic, the mouth gapes and the jaw drops, the upper eyelid tends to droop. The lowering of the upper lid is counteracted either by throwing the head back, or by bringing into action the occipito-frontalis. This give rise to an expression of astonishment in the upper part of the face. In extreme exhaustion or collapse, the jaw drops, the upper lid comes down, the face becomes expressionless. When a violent effort is made the expression comes more nearly to correspond to rage.

A note on the relation of the external carotid artery: DR. WM. KEILLER, of Texas.

Text-book descriptions of the relation of the external carotid (with the exception of Cunningham's description in his 'Dissector's Guide') are incorrect: (1) In describing the ramus of the jaw as an internal relation when it is really external. (2) The structures described in text-books as lying in front are really external. (3) The statements as to its relations to the parotid gland are misleading. (4) It is at first anterior, and slightly internal to the internal carotid, then winds backwards and outwards till it lies on its outer side. (5) Most of the structures described as lying behind it are internal.

How best to teach anatomy to the third year medical students: DR. KEILLER.

Brief sketch of a course of dissections of

direct surgical and medical interest, and leading up to an operative course, being the third year's course of practical anatomy at the University of Texas.

The anatomy of the anal region: Dr. Keiller.

Careful description of the relations of the levator ani, external and internal sphincter, the radicles of the hemorrhoidal veins, and the bearing of these facts on operations for piles and on the pathology of ischiorectal abscess.

On a hitherto unrecognized form of vertebrate blood circulation in organs without capillaries: Dr. Minot, Boston.

Non-development of the left heart and closure of the aortic valve, depending upon an error in the development of the auricular septum: Dr. Blake, New York City.

The child from which the specimen was taken lived four days. It presented no other abnormalities. It was cyanotic and died of cardiac failure. The right chambers of heart, the pulmonary artery and ductus arteriosus are very large. The left chambers are very small. The aortic opening is closed by a fibrous septum consisting of the fused valves. The ascending aorta is only of sufficient caliber to supply the coronary arteries. The eustachian valve is rudimentary.

The valve of the foramen ovale is developed in the right auricle so that fluids can only pass from the left to the right auricle. This arrangement of the valve can be explained by the method of development of the auricular septum, as described by Born in rabbit embryos, if we presume an overgrowth of the septum secundum and an insufficient development of the primary septum. The interest of the specimen lies in the generalization of the application of Born's theory of development. The left ventricle receiving no blood, the aortic valves were kept closed by back pressure and fused. No similar anomalies could be found recorded.

The delimitation of the divisions of the large intestine according to intrinsic features: Dr. Gerrish.

The argument made is that the segment variously called sigmoid colon, sigmoid flexure, iliac colon, and omega flexure, should include all of that part and only that part of the large intestine, caudad of the crest of the ilium, which has a mesentery. This plan would subtract a little from the cephalic portion of the sigmoid colon, as generally accepted now, and would add to its caudal portion making the rectum begin at the third sacral vertebra.

The normal capacity of the human bladder: Dr. Gerrish.

This question can be answered by physiologic tests only. The normal capacity is not shown by the amount of fluid which the viscus can possibly contain without rupture or even by that which it occasionally holds without appreciable harm. But it can be determined by ascertaining the average amount of urine secreted in 24 hours and the average number of micturitions in the same time. By this method the capacity is found to be not much in excess of 250 grams (8 oz.): one-half that usually stated.

Observations on sensory nerve fibers in the visceral nerves, with remarks on their mode of termination: Dr. Huber.

That relatively large medullated nerves end in the viscera we know from the observations of Gaskell, Langley and Edgeworth, and from the more recent investigations of numerous observers who have investigated the sympathetic nervous system or the innervation of the viscera with the aid of the Golgi or methylin blue methods. That these relatively large medullated nerves terminate either in special end-organs, Pacinian corpuscles, encapsulated nerve-endings of Timofew, etc., or in free sensory endings, seems also well established. The

writer proposes to draw attention more especially to the free sensory endings in viscera, and to emphasize the following points: (1) the repeated division of such sensory nerves before losing their medullary sheaths; (2) the relatively large number of arborizations in which such nerves terminate; and (3) the fact that they terminate in the mucosa and epithelium lining the hollow organs and ducts.

Sensory nerve terminations in the tendons of the extrinsic eye muscles of the cat: DR. HUBER.

Marchi, Ciaccio and Sherrington have shown that medullated nerve fibers terminate in the tendons of the extrinsic eye muscles of a number of mammals. These nerves are looked upon as sensory nerves, although, as Sherrington has shown, not branches of the ophthalmic division of the trigeminus. In the cat the nerves ending in the tendons of the extrinsic eye muscles do so in terminations which differ in structure from the neuro-tendinous endings found in other skeletal muscles of this animal. The medullary nerves which terminate in the eye muscles of the cat lose their medullary sheaths just before reaching their destination and end in a network of varicose fibers, which network surrounds the tendon fasciculi just distal to the insertion of the muscle fibers. Each tendon fasciculus surrounded by such a plexus is enclosed within a thin, closely fitting, fibrous sheath.

Comments upon the figure of the mesal (median) aspect of a human brain as published by His and reproduced by him and others: DR. WILDER.

"In the *Archiv für Anatomie* for 1893, Professor His published a figure of the mesal aspect of an adult human brain; it was reproduced on p. 76 of the protocols of the B. N. A., and in the B. N. A. itself, *Archiv für Anat.*, 1895, Suppl. Band., p. 161, but is there stated (evidently through inadvertence) to represent a fetal brain of the third month. The figure has been reproduced without comment by Van Gehuchten (second edition) and Barker ('The Nervous System,' 1899, Fig. 92). Even if designed merely as a diagram in illustration of its author's views of the definitive segments, and even if many teachers and investigators are so well informed as not to be misled by its errors of omission and commission, certain features are certain to cause serious and wide-spread misapprehension. Twenty such features were specified. The most important exemplify the general defect of such figures in most manuals, viz., incomplete circumscription of the cavities, and inadequate demarcation of the cut surfaces from the natural (pial or endymal). In these respects anatomists may well imitate the accuracy of Reichert ('Der Bau des menschlichen Gehirns,' 1859–61), although his figures are not absolutely perfect.

If an 'Isthmus Rhombencephali' why not an 'Isthmus Prosencephali'? DR. STROUD, Cornell University.

"In the early fetal brain of man, the cat, and perhaps some other mammals, there is a necklike region just caudad of the mesencephal. Professor Wilhelm His names this region 'Isthmus Rhombencephali,' and apparently regards it as coördinate with the other five definitive segments recognized by him (*Archiv. für Anatomie*, 1893, 173–174; 1895, Suppl. Bd. 'B. N. A.,' 157). But in these same specimens, and in many of the figures published by His in the *Archiv* for 1892 and 1893, and in 'Die Entwickelung des menschlichen Rautenhirns,' 1891, there is another necklike region cephalad of the mesencephal quite as distinct and sometimes more so. A schema of encephalic segmentation should be consistent, and while not denying the possibility that one or both of these regions may represent a primitive neuromere, it seems reasonable to conclude that, taking into account the

adult and developmental conditions in vertebrates generally, probably neither should be regarded as a definitive segment.

The basis and nature of a schema of the definitive encephalic segments: Dr. Wilder.

"A satisfactory definition of 'Definitive Encephalic Segment' has not yet been framed, but the best example is the Mesencephalon (crura and quadrigeminum). Although developed from one 'vesicle,' this apparently includes at least two of the 'neuromeres or primitive segments.' Many points are still undetermined. Some were discussed in 1897 in 'What is the Morphologic Status of the Olfactory Portion of the Brain?' Others are indicated among the fifty 'Questions as to the Segmental Constitution of the Brain'; copies of the seven mimeographed sheets bearing these 'questions' were distributed at the meeting and will be sent to those interested. The following conclusions are regarded as sound:—The provisional schema of the definitive segments should be based upon adult rather than developmental conditions. The definitive segments need not be structurally or developmentally identical. They need not coincide with either, (*a*) the primitive neuromeres, or (*b*) the primary encephalic vesicles, (*c*) the secondary vesicles. No species or group should be ignored. The presumption is in favor of generalized forms, and not in favor of forms merely because they are available for other purposes. When both naturalness and convenience are taken into account, the best provisional schema corresponds mainly with the one indicated in the table on p. 29 of the Proceedings of this Association for May, 1897."

Is neuron available as a designation of the central nervous system? Dr. Wilder.

"Neuron (from τό νεῦρον) was proposed by me in this sense in 1884 (*N. Y. Med. Jour.*, Aug. 2, p. 114), and employed in the same Journal, March 28, 1885, p. 356; in addresses before the Amer. Neurol. Assoc.; (*Jour. Nerv. and Ment. Dis.*, July, 1885); *Amer. Asso. Adv. Sci. Proceedings*, 1885, and in the second edition of 'Anatomical Technology,' 1886. It has been adopted by McClure, Minot, Waters and others. The reasons for its abandonment in 1889 for *neuraxis*, as stated in the Proceedings of this Association for 1895, p. 44, and Ref. Handbook of Med. Sci., IX., 100, now seem to me inadequate. *Neuron* is the basis of *neural* (as applied to aspect, folds, furrow, and canal) and of *neurenteric* and other compounds, and it is the natural correlative of *enteron* (entire alimentary canal) and of *axon* (notochord or primitive skeletal axis). Not until 1891 did Waldeyer propose *neuron* for the nerve-cell and its processes; not until 1893 did Shafer apply it to the axis-cylinder process. As with *tarsus* and *cilium* the context would commonly avert confusion between the macroscopic and microscopic significations of the word in a given case. The compounds *macroneuron* and *microneuron* might be employed if necessary, or (as suggested by Barker, p. 40), the histologic element might be designated by *neurōne*, as if from νευρών. Note.—The question is now further complicated by Van Gehuchten's adoption of 'Neuraxe' as the title of a new journal of neurology.

Polydactylism and Syndactylism: Dr. Shepherd, of Montreal.

Dr. Shepherd showed a series of skiagrams and photographs illustrating some of the deformities of the digits which he had met with. The first case was that of a young man aged 21, who had six digits on each foot and hand, and they were so arranged that the deformity would not be noticed unless attention was especially attracted to there was a gradual diminution in the size from the middle finger to the supernumer-

ary little digit (post minimus). His paternal greatgrandfather had supernumerary digits, as had a paternal uncle, and this uncle's children had supernumerary digits. Two of his own brothers and two of his sisters had a like conditions as well as his sisters' and brothers' children. In another case also there was a hereditary history for some generations on the father's side. Another case was stated and the photographs shown where, in a man aged 22, there was no thumb on the left hand and only a very rudimentary one on the right hand; no history of heredity. Another, where there was absence of the thumb of right hand and a rudimentary little finger with absence of the fifth metacarpal bone. The father had a similar deformity. A remarkable skiagram was exhibited which showed a fusion anteriorly of the proximal phalanges of the middle and ring fingers, and a complete fusion of the middle and distal phalanges of these fingers; also a case of fusion of the ring and middle fingers of the right hand in a boy age 20. In neither case was there any history of heredity. In the case of polydactylism, Dr. Shepherd thought some of the cases might be due to reversion, but the majority he thought were probably the result of dichotomy.

D. S. LAMB,
Secretary.

SCIENTIFIC BOOKS.

Kongl. Svenska Vetenskaps-Akadamiens Handlingar, Bandet 31. No. 5. Rhopalocera Æthiopica. Die Tagfalter des Æthiopischen Faunengebietes. Eine Systematisch-Geographische Studie. CHR. AURIVILLIUS. Pp. 571. Six chromo-lithographic plates containing 50 figures. Numerous figures in the text. Large 4to. Stockholm, 1898.

Without the aid which learned societies are sometimes able to supply, important works, like the Rhopalocera Æthiopica of Professor Aurivillius, would not often see the light. The demand for such treatises is restricted, being largely confined to specialists, and the expense of producing them is necessarily very great. For many years the learned author has been gathering the material for his undertaking, which having been completed, was laid before the Royal Academy of Sciences in Stockholm on the 10th of June, 1898. The work was issued from the press in June of 1899.

After a brief introduction the author defines the limits and subdivisions of the Ethiopian Region, closely following Wallace, Sclater and others, and excluding the regions immediately bordering upon the Mediterranean from consideration, because the fauna of the northern coast-lands is distinctly palæarctic, and including southern Arabia, the tropical islands, and Madagascar.

This chapter is followed by a bibliography of the subject, arranged according to the political subdivisions of the region. The list of books and papers, while extensive, is, nevertheless, not as complete as might be desired, a number of titles having been apparently overlooked in preparing the bibliography, although in most cases they are subsequently referred to in the text.

The systematic position of the Rhopalocera is next discussed. The author follows Haase and E. Reuter in excluding the Hesperiidæ from the Rhopalocera, regarding them as an independent group, the *Grypocera*, of equal value with the butterflies, and intermediate between them and the moths, or Heterocera. In this view, he will probably find few followers, although a good deal may be said in favor of such a procedure. The Hesperiidæ are accordingly excluded from consideration in the treatise, which enumerates sixteen hundred and thirteen species of Rhopalocera, in this restricted sense, as occurring in the Ethiopian region. Of these species thirty-three, or 2.04 per centum of the whole, also occur in other faunal regions. If we include the Hesperiidæ enumerated by the present writer in his 'Synonymic Catalogue of the Hesperiidæ of Africa and the Adjacent Islands,' published in the Proceedings of the Zoological Society of London in 1896, to which some twenty or more species, described since then must be added, we have a total of nineteen hundred and eighty, or, in