formerly professor of materia medica and anatomy in the Edinburgh new Veterinary College and the Albert Veterinary College; chairman of the United States treasury cattle commission; State veterinarian of New York; consulting veterinarian to the New York State Agricultural Society; chief director of the United States Bureau of Animal Industry for the suppression of lung plague in the Mississippi valley and in New York; member of the tuberculosis commission of the State of New York; chairman of the regents' board of veterinary examiners for New York and author of a 'General and Descriptive Anatomy of the Domestic Animals,' the 'The Farmers' Veterinary Adviser' and numerous monographs on veterinary subjects.

2. For professor of veterinary surgery, obstetrics, zootechny and jurisprudence: (Appointment not yet made.)

3. For professor of veterinary and comparative pathology and bacteriology: Veranus Alva Moore, B.S., M.D.; chief of the pathological division of the United States bureau of Animal Industry, Washington, D. C., professor in the National Veterinary College and of histology in the medical department of the Columbian University, Washington, D. C.; author of numerous bulletins on the pathology and bacteriology of animal diseases, published by the Bureau of Animal Industry.

4. For assistant professor of veterinary and comparative physiology, materia medica and pharmacy: Pierre Augustine Fish, B.S., D.Sc., D.V.S.; assistant in the pathological division of the United States Bureau of Animal Industry, Washington, D. C.; formerly instructor in physiology and vertebrate zoology in Cornell University, and in zoloogy in the Marine Biological Laboratory at Wood's Holl; author of several papers on the structure and function of the nervous system and on pharmacological subjects.

5. For assistant professor of veterinary anatomy and anatomical methods: Grant Sherman Hopkins, B. S., D. Sc., instructor in comparative anatomy and embryology in Cornell University, author of monographs on topics in comparative anatomy and histology and on methods of anatomical and physiological demonstration.

6. For professor of microscopical technology, histology and embryology: Simon Henry Gage, B.S., professor of anatomy, histology and embryology in Cornell Unisity; former chairman of the section of biology of the American Association for the Advancement of Science, and president of the American Microscopical Society; author of notes upon Histological Methods, the Microscope and Microscopical Methods; joint author of Anatomical Technology; contributor to Wood's Reference Hand-Book of the Medical Sciences, to Foster's Medical Dictionary and to various scientific periodicals and transactions.

7. For instructor in microscopy, histology and embryology: Benjamin Freeman Kingsbury, A. B., Ph. D., formerly graduate scholar and fellow in Cornell University; author of monographs on histology and upon the structure and morphology of the nervous system and organs of sense.

8. For assistant in veterinary bacteriology: Raymond Clinton Reed, Ph.D.

CURRENT NOTES ON PHYSIOGRAPHY.

RIVERS OF CENTRAL IOWA.

The annual report of the Iowa Geological Survey for 1895 contains an essay by J. L. Tilton, of Indianola, on Warren county, in the south-central part of the State, in which particular attention is given to the origin of the river courses. The small ravines are post-glacial, consequent on the slope of the surface. The larger streams follow preglacial valleys, though they have not yet cut down to the bottom of the drift that clogged their former courses. It is believed

that in Cretaceous times the chief drainage was down the faint dip of the strata to the southwest, with longitudinal subsequent branches along the strike of the weaker shales; but post-Cretaceous elevation being greatest to the northwest, the southeast-flowing subsequent streams gradually gained possession of the drainage and became the chief rivers of the region; the Des Moines being an example of this kind. Diverted consequent streams enter these masters from the northeast; headward-growing obsequent streams enter from the southwest, perhaps marking the reversed paths of former beheaded consequents; the streams of Warren county being chiefly of the latter class. Faint escarpments facing northeast are formed along the outcrops of the harder strata. The larger streams have broad flood-plained trenches below even uplands of adolescent dissection; but to cite these trenches as examples of the 'immensity of erosion' leaves no fitting term for the much greater erosion by which the generally even surface of the uplands was fashioned.

GEOMORPHOLOGY OF NORWAY.

PROF. EDUARD RICHTER gives further account of his work last summer (See SCIENCE, June 26), in his '*Geomorphologische Beobachtungen aus Norwegen*,' contributed to the Vienna Academy (Sitzungsber., Feb., 1896), from which a very clear picture of *fjeld* and *fjord* may be gained. Much importance is attached to the increased rate of weathering in the belt above the limit of vegetation and below the snow line. The plateau-like uplands are ascribed chiefly to this process, and not to peneplanation during a lower stand of the land, as advocated by some authors. The mountains of Jotunheim are regarded as unconsumed remnants of a once much greater mass, now far advanced in reduction to the upland level. Well formed cirques (*Botner*) characterize the later stages of this reduction, and many examples are mentioned in various stages of development. These forms are explained as the result of retreat by weathering back from a reëntrant on which a protective covering of névé or ice lies; and thus explained, they are regarded as trustworthy witnesses of former glacial action in various mountains of middle Europe. As a special feature of the Norwegian fiords, Richter emphasizes not only their U-shaped cross section, but also the discordance of their floor level with that of many side valleys; the steep side-wall of the deeper fiord cutting square across the floor of the shallower side valley. This is ingeniously explained as a modification of a preglacial valley system by a glaciation of just such severity as would fill some valleys with long ice streams, while certain confluent valleys of less and lower catchment area would be occupied by relatively inactive ice or only by névé. The latter valleys would then be little modified, while the former would be rapidly deepened and changed from V to U form.

This essay is of particular interest in giving a clear analysis of the relation of form to process, and in attributing much influence to the climatic control of denudation, both as determined by altitude above sea level and as affected by glacial or interglacial conditions; but the sufficiency of the process suggested for the production of the uplands needs further demonstration.

LITTLEDALE IN THIBET.

LITTLEDALE'S adventurous effort to reach Lhasa is described in an entertaining narrative with incidental mention of notable physiographic features. A number of volcanoes were seen in Thibet south of Cherchen (mid-southern border of the desert of Gobi). Thereabouts, the drainage from the mountains enters salt lakes in flat intermontane depressions of great altitude. Further southeast, rivers escape to the sea in

deep valleys and entirely change the aspect of the country. The lakes all stand lower than their ancient shore lines; many small basins of to-day having formerly united in large confluent water bodies. This narrative, like many of its class, indicates great courage and endurance on the part of the explorers, but abounds with personal incidents rather than with geographical matter. (London Geogr. Journal, May.)

DANGER FROM THUNDERSTORMS IN ARABIA.

An excursion of twelve years ago in Oman, southeast Arabia, lately described by S. B. Miles, gives once again an impressive picture of the immediate independence of desert tribes on the wadies or water courses, which determine the place of all the villages and of nearly all the roads. A canyon, six miles long and 1,000 to 1,500 deep, between neighboring valleys, was luckily passed through a day before a heavy thunder storm; less fortunate travellers are not unfrequently overwhelmed in it by the sudden rise of the stream, from which there is no escape. "The huge walls of rock give the appearance as if the mountain range had been suddenly split in twain from the base to the summit by some convulsion of nature." If a real, convulsively split canyon is some day found, what an agreeable change it will be to read: "The huge walls of the fissure formed by this convulsion of nature look just like the walls of ordinary gorges that have been slowly cut down by streams." (London Geogr. Journ., May.)

HILL ON CENTRAL AMERICA AND ANTILLES.

The May number of the National Geographic Magazine has an article by R. T. Hill on the geographic relation of the three Americas, North, Central and South, contending that the North American cordilleras terminate with the line of Mexican volcanoes west of Vera Cruz, that the Andes terminate south of the Isthmus of Panama, and that Central America is to be associated with the transverse deformations of the Antilles; the latter lying on lines of east-west corrugations "which have persisted without continental connection or union with each other since their origin." Thus interpreted, these islands belong to a class that should be welcomed by the physiographer as desiderata, long ago deduced as possibilities, and prepared for in his scheme of classification, but of rare occurrence on this small earth during the brief epoch in which we know it.

W. M. Davis.
Harvard University.

CURRENT NOTES ON METEOROLOGY.

INTERNATIONAL CONGRESS OF HYDROLOGY AND CLIMATOLOGY.

The Fourth Session of the International Congress of Hydrology, Climatology and Geology will be held at Clermont-Ferrand from September 28 to October 4 of this year. Scientific societies in all parts of the world are invited to take part in this Congress. The French railroad companies have reduced their fares 50% for those who attend the meeting, and the *Compagnie Générale Transatlantique* has given a reduction of 30% to those who travel by its steamers. Among the meteorologists who have charge of the meeting are Angot, Teisserenc de Bort and Plumandon. The list of questions to be considered in the section on climatology is the following: Meteorological observations, their part in the study of climates; What is meant by mountain climate?; Investigation on the proper means of determining the degree of clearness of the sky, of its color, and of these influences in hygiene; The prevalence of winds in certain regions, and their influence on sanitary conditions. Membership in the Congress costs 20 francs, and subscriptions may be sent to M. Doin, 8 Rue de l'Odeon, Paris.