

wheats he finds a certain number of bivalent chromosomes, which are all telosynaptic or end-to-end. In crosses between *A. cylindrica* and the 6n wheats, however, he always finds constantly 7 parasyndetic bivalents formed from the end-to-end arrangement by the chromosomes swinging round to lie side by side. This, as well as the characters of *cylindrica*, point to the presence of 7 *cylindrica* chromosomes in the hexaploid wheats. Hence telosynaptic pairing is regarded as evidence of a less complete homology or a more distant relationship between the members of a pair than is parasygnapsis.

The hybrid *A. cylindrica* × *A. ventricosa* is sterile, but its characters show remarkable resemblance to those of *T. spelta*. In meiosis there are 5-7 bivalent chromosomes, chiefly parasyndetic but some telosyndetic, indicating that one set of chromosomes are homologous in the two species. The two types of pairing are also described in various species-hybrids by Aase. Percival also considers *T. dicoccoides* (4n) to be an autoploid of *T. aegilopoides*, and concludes that the emmer wheats are probably autoploids from the Einkorn wheats. These conclusions, however, require further evidence.

Nishiyama (1930) has described similar conditions in crosses of *Avena* species. *A. fatua* (n=21) × *A.*

sativa (n=21) gives a hybrid with 21 parasyndetic bivalents in meiosis, leading Percival to conclude that cultivated oats was derived from the wild *fatua*, while *A. barbata* (n=7) × *A. sterilis* gives telosyndetic pairs.

Watkins (1930) has just published an extensive critique of all the work on wheat (*Jour. Genet.*, vol. 23, No. 2), in which he points out difficulties with the theory of cumulative factors for size-inheritance as applied to wheats, and shows that the chromosome behaviour of hybrid cereals requires further study. While the details therefore remain uncertain, there is evidence for concluding that the origin of the hexaploid wheats has involved interspecific and intergeneric crossing, with allopolyploidy and probably also autoploidy, combined with the occurrence of numerous parallel unit mutations.

A recent study of the related grass genus *Agropyron* by Peto (*Can. Jour. Research*, vol. 3, p. 428) again shows 2n, 4n, and 6n species (n=7), with evidence of natural hybridisation between species having the same or different chromosome numbers. This condition is probably very similar to that under which the wheats evolved, except that the hexaploid wheats may have arisen entirely under conditions of cultivation.

Upper Atmosphere over India.

THE inexpensive type of apparatus for obtaining readings of pressure and temperature at great heights in the upper atmosphere which was invented by the late W. H. Dines in 1907 has been employed in many countries. It has been used with one minor modification at Agra (*Gerlands Beiträge zur Geophysik*, vol. 25 (1930), pp. 266-278, by G. Chatterjee and N. K. Sur).

In Dines's apparatus the graph of each record, temperature and pressure being the ordinates and abscissæ, is traced by a sharp non-rusting steel point on a silvered copper plate little larger than a postage stamp, the motion due to variations of pressure being provided by a small aneroid box and those due to change of temperature by the expansion and contraction of a rod of German silver. Difficulty was experienced at Agra in obtaining a continuous scratch on the recording plate, especially when the sounding balloon carried the instrument into the stratosphere, which is there reached at a higher level than over the British Isles, and is in consequence much colder. It was found that the substitution of a deposit of colloidal graphite on glass, for the silver surface, overcame this tendency, and allowed very sharp records to be obtained with only slight pen pressure.

Owing to the rapidity with which rubber balloons perish in India, Vulpro tissue balloons (see *NATURE*, vol. 124, p. 793; 1929) were substituted for them in 1926; since then balloons have often risen as high as the stratosphere, and the number of observations obtained permits of a fairly detailed account of the seasonal changes of temperature between the level of the ground and a height of 20 km.

The monsoon season in India (June to September) was found to be decidedly the hottest up to nearly 14 km., and at this season the lapse-rate of temperature is higher between 12 km. and 15 km. than lower down, a state of affairs believed to be due to a difference of origin of the air above and below the average level of the cirrus clouds (12 km.). The base of the stratosphere (the 'tropo-pause') appears to be found at an average height of about 16 km. or 17 km. at all seasons, but its mean temperature has an annual variation with a minimum of 19° A. at about the end of the rainy season. The lowest value obtained at Agra so far is 181° A. at a height of 16.5 km. on Oct. 4, 1928, which equals the lowest yet found—at a slightly higher level—over Batavia in 1923, which for long was regarded as the lowest atmospheric temperature observed anywhere in the world.

'Sea Trout' or 'Bull Trout'?

THE brown trout and the sea trout, possibly members of one plastic species, have been the cause of much controversy. Living under widely varying conditions and possessing very different habits, they show differences in appearance which have given ground for much 'splitting' in the past. Furthermore, because they have come much under the eye of observant anglers, many without the knowledge of a trained biologist, who himself is always in difficulties when deciding where a 'species' ends and where it begins, it is natural that the popular accounts of these fish have shown very divergent opinions. That they are specifically indistinguishable is perhaps the general consensus of opinion at the present day, but there has still been a certain amount of indecision as to where exactly to place the so-called 'bull trout' of the Tweed and other rivers.

A critical examination of the sea trout of the river Tweed * comes therefore as a welcome addition to our knowledge of this interesting species. Mr. G. H. Nall, of the Scottish Fishery Board, has shown that the sea trout of the Tweed exhibit a marked difference from those of many other Scottish rivers in the great rapidity of their growth during sea life. As an example, the average weight of a fish in its third sea summer for the Tweed is 7 lb. 7 oz., as against 3 lb. 5 oz. for the Howmore, 2 lb. 13 oz. for the Ailort, 2 lb. 6 oz. for the Forth, and 2 lb. 3 oz. for the Spey. Similarly, for fish in their fifth sea summer the average weight for the Tweed is 12½ lb. as against the highest of 6 lb. 7 oz. for the Howmore amongst the above four rivers.

* Fisheries, Scotland, Salmon Fish., 1929, No. 5: Sea Trout of the River Tweed. By G. Herbert Nall. (London: H.M. Stationery Office, 1930.) 3s. 6d. net.

Coincident with this rapidity of growth is a short span of life, and consequently few spawning operations. There is an indication that the Tweed sea trout travel very far afield during their sojourn in the sea, which may account for their great growth ; marked fish have been recovered from the South Esk, from off the Norfolk coast, off the Dutch coast, and off the Jutland coast of Denmark, though the numbers of recaptures from each place so far only amount to single figures.

Owing to the divergent characters of the spawning grounds in a river with so large a number of tributaries as the Tweed, and since the fish may stay close to their home neighbourhood or range very far afield during their sea life, it is possible that various types of fish may become apparent. As a result of his examinations, Mr. Nall comes to the opinion that "there is no evidence to justify the old belief that the Tweed has two or more distinct races of sea trout". He considers, however, that the sea trout of this river undoubtedly do form a well-marked local race, similar to that found in Northumbrian rivers to the south ; but that this does not warrant them being considered a different species as the name *Salmo eriox* would imply, nor is the name 'bull trout' applicable, since it is a term applied in different districts to very different types of fish and is therefore misleading.

F. S. R.

University and Educational Intelligence.

BIRMINGHAM.—In his annual report to the Court of Governors, the Vice-Chancellor, Sir Charles Grant Robertson, announces that during the past session the upward tendency in numbers of students at the University was maintained. The number of new entries for the present session, however, shows a slight falling off. Sir Charles Robertson is of opinion that while the depression of trade may have little effect on the number of students entering the University, it has marked and far-reaching effects on the student who has, in consequence, perhaps £10 a year less to spend on the amenities which mean so much in a university education, as distinguished from mere university instruction. Considering that 49 per cent of the students hold scholarships or have assistance in meeting the expenses of their university careers, and that about 53 per cent began their education in elementary schools, it will be understood that such a curtailment of spending power affects many. "Hence, particularly in hard times, it is wise as far as possible to remember that expenditure on Library, Refectories, and Halls of Residence have their educational values. . . . In principle, the application of university income to promote activities or create opportunities, so as to secure that a university education, and not merely university instruction, is provided, is as justifiable as the allocation of that income to scholarships, exhibitions, lecture rooms, or apparatus." Reference is made to the increase in the Government grant to the University, and it is suggested that about half of this should go to increase the salaries of professors. The voluntary medical examination of intending women students has proved so satisfactory that all the women avail themselves of it, and it is suggested that a similar opportunity should be given to the men students.

Prof. S. W. J. Smith has been appointed to represent the University at the Clerk Maxwell Centenary at Cambridge in October.

CAMBRIDGE.—The Appointments Committee of the Faculty of Biology 'A' has appointed Mr. W. B. R. King, of Magdalene College, to be University lecturer in geology. The Faculty Board of Biology 'A'

has appointed Dr. H. Godwin, Mr. J. Gray, of King's College, Dr. H. H. Thomas, and Dr. F. F. Blackman, of St. John's College, to be members of the Botanic Gardens Syndicate.

LONDON.—The London County Council has informed the University that the Council's block maintenance grant to the University in each of the four academic years, 1931–32 to 1934–35, will be £125,000. This is an increase of £20,000 on the Council's grant for the current year and of £44,000 on that for 1929–30.

ST. ANDREWS.—Dr. D. F. Cappell, lecturer in pathological histology in the University of Glasgow, has been appointed professor of pathology in the University of St. Andrews in succession to Prof. Sutherland, who retired at the end of last academical year. Dr. Cappell graduated in the University of Glasgow as M.B., Ch.B., in 1921, and has since been engaged in teaching and research work in pathology in the University of Glasgow.

WALES.—Five fellowships, each of the annual value of £200 and tenable for two years, are being offered to graduates of the University of Wales. Applications should be sent, by, at latest, June 1, to the Registrar, University Registry, Cathays Park, Cardiff.

AN election to Beit fellowships for scientific research will take place in July. Only candidates less than twenty-five years of age are eligible. The latest date for the receipt of applications (which should be sent to the Rector, Imperial College of Science, South Kensington, S.W.7) is April 14.

The following scholarships are being offered by King's College of Household and Social Science : a 'Carl Meyer', value £80 a year, tenable for three years, and a 'Minor College', value £40 a year, tenable for three years. Particulars can be had from the Secretary of the College, Campden Hill Road, W.8.

TATE and Morgan scholarships for the session 1931–1932 are being offered by Battersea Polytechnic, and the examinations for them will be held on June 9 and following days. The scholarships will be tenable for two or three years. The yearly value of each will be from £20 to £30, with free tuition. Particulars are obtainable from the Principal. Applications must be made, at the latest, by April 18.

NOTICE is given by the Faraday House Electrical Engineering College that examinations for the Faraday and Maxwell scholarships will be held on Mar. 31, April 1 and 2. The annual value of the former scholarship is 80 guineas, and that of the latter 60 guineas. The scholarships are tenable for two years in the college and one year in works. Particulars are obtainable from the Registrar of the College, 62 Southampton Row, W.C.1.

THE Board of Education is again prepared to receive applications for Full-Time Studentships from teachers desiring financial assistance in order to attend approved full-time courses of advanced study at universities or other institutions at home or abroad. The amount of grant is fixed by the Board and cannot exceed £100 for an academic year. The course proposed, if academic, should be of post-graduate type, but the Board is prepared to consider also proposals involving travel or the practical study of industrial conditions connected with the teaching of technical subjects. Applications for the year 1931–32 should be made before May 31. Further information and application forms can be obtained from the Board of Education, Whitehall, London, S.W.1.