sanction of the Czar's government, our author has shown us the interior of the other prisons to which political prisoners are sent, and has added a sketch of the life led by the suspects in exile. This occupies the middle of the volume, which opens with an account of the constitutional development of Russia—if it can be called development, when nearly all the movement has been backwards—and it is followed by a dry though useful description of the educational system of the country, written with a view to show its utter inadequacy. Stepniak, whose recent articles in the London *Times* on the present state of the Russian army are full of interest, possesses a talent for describing scenes of suffering and woe, which would have made his or her fortune if turned into the profitable channel of sensational novel-writing. But this same faculty prejudices his reader against him as the truthful narrator of scenes in actual life, and one puts the book down with a feeling that, after all, the author has been trifling with his sympathies.

JOHNSON'S SURVEYING.

THE method of ascertaining distances and elevations by means of the engineer's transit instrument and stadia—where the apparent length on a staff intercepted by two parallel wires in a telescope gives the distance of the staff from the instrument, and the vertical angle serves to determine the elevation—has not, as yet, become well established in private surveying practice, although no one who is well informed in such matters doubts its applicability to a large range of geodetic work, its accuracy and convenience.

The use of the stadia has been confined almost altogether to the U. S. and state surveys. The experience which Professor Johnson, of Washington university, St. Louis, gained while engaged on the surveys of the great lakes and the Mississippi River, has enabled him to prepare a very clear and concise manual of the operations of topographical surveying as there practised. He also gives a detailed description of the work of measuring a base-line and triangulating when the survey is of moderate magnitude, indeed for any work except the most important, and he explains the projection of maps for large and small areas.

The book is well suited to the class-room and the field. We should have preferred, however, to find his discussion of utility and universal applicability of the method placed in the introduction instead of the body of the text, or gathered into a note, for, when the reader is once assured of its reliability, he will be likely to feel that a manual is needlessly encumbered with such arguments.

A manual of the theory and practice of topographical surveying by means of the transit and stadia; including secondary base-line and the triangulation measurements and the projection of maps. By J. B. JOHNSON, C. E. New York, *Wiley*, 1885.

NEW BOOKS.

**** For full titles see 'Publications received at editor's office.'*

'Aid to engineering solution' (Jackson) is intended to correspond with 'Aid to survey practice,' and to afford a succinct account of a simple general method of effecting engineering solutions, as well as to give a complete set of solutions useful to the engineer.——'Commercial organic analysis' (Allen) is the first volume of a revised edition, devoted chiefly to the consideration of bodies of the fatty series and of vegetable origin, and includes chapters on alcohols, ethers, and other neutral derivatives of the alcohols, sugars, starch and its isomers, and vegetable acids. The second volume is already on the press, and treats more especially of coal-tar products and bodies of the aromatic series, the fixed oils, and the products of their saponification; and the tannins will also be considered. It is proposed to devote a third volume to nitrogenized organic substances.——'Henfrey's English coins' (Keary) is a new edition of Henfrey's 'Guide to English coins,' with some corrections and enlargements, without any decided alterations in the form of the book.——'Silos for British fodder crops' (*The field*) is a third edition, the same as the last excepting that 48 pages have been appended to supply particulars respecting the ensilage competition of 1884.——'Mikroskopische reactionen' (Holtzendorff) is an attempt to bring together, for the use of chemists, reactions based on the crystalline form and optical qualities of substances, which can be used under the microscope.——'Spezial-karte von Africa' (Habenicht, Domann, and Lüddecke). This map, published by Justus Perthes in Gotha on the occasion of the centennial of the foundation of that house, is being made under the direction of Hermann Habenicht, Bruno Domann, and Dr. Richard Lüddecke. It will be published in ten parts on a scale of 1: 4,000,000.

GEOGRAPHICAL NOTES.

CHAFFAUJON writes from Ciudad-Bolivar of his recent journey to the upper Orinoco and Cauca rivers. He was accompanied by Indian guides, two from the Arigua tribe, an Arebato and a Guagnungomo, the latter belonging to a tribe feared for its valor and ferocity by all the people of the region. The party passed without difficulty as far as a little village near the Brazilian frontier, where

the Guagnungomo disappeared. This put the traveller on his guard, but, while rifling a burial place of the same tribe, he was suddenly attacked by a party of them, led by his former guide, who shot the Arebato fatally, but failed to wound Chaffaujon. The latter killed the renegade, whose companions disappeared, but carried or drove off all the animals and equipment of the party, as well as one of the Ariguas. With the other, however, the traveller escaped and reached the Cauca, which he descended on a raft to Tremblador, where the authorities had arrived with a military party in search of him. It would seem that it was his intention to return to Europe before long.

The U. S. revenue cutter Corwin arrived in San Francisco from the arctic, October 12. She brought with her the party sent out by General Miles last year to explore between the Copper and Yukon rivers. They were Lieut. H. F. Allen and Sergeants Robertson and Ficket of the Army signal office. They had crossed from the headwaters of the Atnah River to those of the Tananah, descended the latter to the Yukon, and the Yukon to the sea, accomplishing a most creditable journey, and one which a previous military party under Lieut. Abercrombie had failed to carry out. A considerable part of it was over an unexplored region. Messrs. Garland and Beatty, two English travellers who had crossed from the Mackenzie to the Yukon and descended the latter, were taken up with the American party at St. Michael's and brought to San Francisco. The Corwin also brought the crews of the Napoleon, the George and Susan, and the Mabel, three whalers lost this season in Bering Sea and the arctic. We have referred previously to the loss of the Napoleon; the two others appear to have been blown ashore in a gale, August 10, near Wainwright inlet, in latitude 70°. Three of the crew of the George and Susan were lost, but the catch of oil and bone was saved and brought down by the bark Ohio. The Corwin party themselves have accomplished some creditable exploring work during the season. Lieutenant Cantwell returned to his explorations of the Kowak River, while Asssistant engineer McLenegan, his companion in 1884 (*Science* No. 98, p. 551), undertook the exploration of the Nunatok, or Noatok, River, a stream falling into Hotham inlet, near and west from the Kowak, and so far less known than the latter. The Inland, or Noatok, River had been supposed to be a more important stream than the Kowak until the investigations of Cantwell and Stoney threw a doubt on the matter. Stoney's party, whose preparations for wintering we have already noticed, sent a mail down by the Corwin, which left them near the head of Hotham inlet. The explorations of the present year were entirely successful, and will be referred to again when details have been received.

Thoroddson contributes to *Globus* an account of his explorations in Iceland in 1884, which is more full and precise than the notes previously published. It appears that in a journey of ten weeks over the Odádahraun desert and the adjacent mountains, about one-half was passed in an uninhabited region, much of which was completely unknown. He forced his way along the northern base of Vatna Jokull, the journey being frequently hazardous and always laborious. Many corrections of heights were made, and it seems that Jökulsa, which has been taken as the longest Icelandic river, is exceeded by Thiörsa, which is some 120 miles in length. An ascent of the unvisited and important Dyngja volcano was made. It proved to have a double crater, the inner one being 600 feet or more in depth.

The autumnal exodus of the fleet from Alaskan and arctic waters brings letters and successive mails with a profusion which contrasts strangely with the one opportunity of midsummer or the want of any opportunity from October to March, west of Mt. St. Elias. The sealing schooner San Diego, which has had a thrilling history in Alaskan waters and was thought to have foundered this fall in a severe gale, has reported in good order. The coast survey steamer Patterson, which has been surveying in Alaskan waters during the summer, has put in to San Francisco, having encountered heavy gales on the way down. The whalers are reporting, after an unusually successful season; the first to appear being the Coral with 1,600 bbls. of oil and 16,000 pounds of whalebone. She brought a slab of baleen from the Alaskan right whale, captured off Kadiak, and now very rare, which excited the astonishment of old whalers. It was only six feet long, but weighed nine hundred pounds, and is said to be the heaviest on record from the Pacific. According to advices from Kadiak, of Sept. 22, that flourishing village of St. Paul had not to that date seen or heard anything official of the existence of the supposed territorial government, instituted nearly two years ago. No revenue cutter had visited them for three years, although this is the port of third importance in the territory, with a good commerce and boasting a deputy collector of customs. The salmon canning had ceased for the season; owing to the low price of fish, but 60,000 cases of salmon and boneless codfish had been put up, with about 1,000 barrels of salt salmon and a certain amount of smoked halibut. Reports from the other fishing stations and the outlying trading posts had not been received, but the harvest of furs and sea-otter skins was an excellent one wherever heard

from. Wreckage of oriental origin, including part of a vessel's rail with a money box cut into it and containing some Chinese coins, had been picked up on the shore of Montague Island, Prince William Sound. The season at Kadiak had been a fine one, the crop of potatoes and especially of cauliflowers being very successful, but at Iliamna trading station, Cook's Inlet, a freshet occurred during the summer, by which the course of a small stream was changed and the trader's house actually washed away. A gale in July at Cold Bay, on the peninsula, caught a sea-otter party of Aleuts far from land in their kayaks, and for forty-eight hours they were obliged to use their paddles to keep from foundering. Five were drowned. The volcano of St. Augustin in Cook's Inlet continues to emit smoke and steam from many fissures. Water is still very scarce there, but several white otter hunters have established themselves upon the island for the winter. In southeastern Alaska the Treadwell or Paris mine is proving a great success. The new mill, numbering 120 stamps, sent down $95,000 as the result of the first twenty-five days' work, and there is an almost unlimited quantity of low grade ore milling, net, about $5.00 to $8.00 gold per ton. This has stimulated work on the gold mines near Sitka, which are much richer but less extensive.

ASTRONOMICAL NOTES.

Meeting of the Astronomische gesellschaft.—*Nature* (xxxii., 516) gives a rather full account of the meeting of the Astronomische gesellschaft held at Geneva, August 19–22. Among about fifty members present we see the names of Struve, Newcomb, Christie, Auwers, Krueger, Tisserand, Weiss, and Schoenfeld. Reports were read on the present state of the computation of planetary orbits, on the zone work of the society, and on the photographic mapping of the stars of the Bonn *Durchmusterung* begun by Gill at the Cape. Professor Auwers read a paper by Professor Pickering on the photometric survey of the heavens, which was heard with especial interest; and Staatsrath Struve, in presenting photographs of the Pulkowa 30-inch refractor, expressed his complete satisfaction with the instrument. On the last day of the meeting addresses were made by Professor Gyldén on the graphic representation of planetary orbits, by Professor Newcomb on perturbations and their numerical calculation, and by Dr. Mueller on modern photographic apparatus. Other papers were read by Professors Bakhuyzen, Seeliger, Safärik and Weiss. The subject of most general immediate interest was the discussion of the sixth resolution of the Washington meridian conference, recommending a change in the beginning of the astronomical day. Struve, Folie and Pechüle seemed to be the only members in favor of the change, while Newcomb, Weiss, Krueger, Dunér, Auwers, Tietjen and Safärik, spoke in opposition to it. Professor Gyldén thought it inexpedient to make the change at present, though he was of the opinion that, in twenty or thirty years hence, the majority of astronomers would be in favor of a universal time. The statement by Struve that in the Royal astronomical society the majority are in favor of the universal time, has been corrected by Mr. Downing of the Greenwich observatory, who says (*Nature* xxxii., 353) that "the Royal astronomical society as a body has not expressed any opinion on the subject. And judging from the individual expressions of opinion which have been published, I should imagine that here, as at Geneva, the majority of real workers in our science (with the probable exception of those engaged on solar work) would be opposed to the proposed change." No resolution in regard to the matter was passed by the gesellschaft. The next meeting will be held at Kiel in 1887.

Displacement of solar lines.—In order to obtain, if possible, further evidence upon the disputed question as to whether the displacements and distortions of lines in solar spectra are due to actual drag of masses of gas to or from us, sometimes calling for velocities of 400 or 500km. per second, M. Trepied proposes, in the *Bulletin astronomique* for August, an arrangement of apparatus by which, after the light has passed through slit and collimator, the beam shall be divided so as to show two spectra superimposed at any desired point of either, thus allowing simultaneous optical examination, or micrometrical measurement, upon two lines from exactly the same part of the sun. He then proposes to test Fizeau's law that the ratio of displacement to wave-length, $\frac{\Delta\lambda}{\lambda}$, should be constant throughout the spectrum, for any one velocity of the luminous source to or from us. He will begin with the C and F lines of hydrogen, the ratio of whose wave-lengths is about 1.35 to 1.00. It would seem as if this difference should show plainly in the relative displacements, but it must be remembered that the largest of these take the form of very irregular distortions of the lines, and the different brightness and color of the lines and their background may perhaps differently affect their visible or measurable limits. His results will be awaited with interest.

Parallax of 40 o^2 Eridani.—Professor Hall publishes, in No. 2682 of the *Astronomische nachrichten*, the results of observations made in 1883 and 1884