

inches of water is run, and on top of this the oil. Any impurities settle to the bottom of the water, and are left when the oil is drawn off. In some of the larger refineries these bleachers literally cover acres of ground. The great objection to this method of bleaching is the length of time occupied and the immense space taken up by the bleachers.

It may be asked, What is the object of deblooming oils? So far as I can learn the only object is that they may be used to adulterate the more expensive animal and vegetable oils, such as lard, tallow, linseed, and cottonseed oils.

A mixture of lard oil, 75 per cent at 50 cents a gallon, and debloomed neutral oil, 25 per cent at 13 cents a gallon, will pass for pure lard-oil with anyone but an expert. This fraud may be detected by the lower flashing and burning points of the mixture and by the change in specific gravity from that of pure lard oil. The tests mentioned above may also be applied.

D. T. MARSHALL.

Boston, Mass., April 21.

### ASTRONOMICAL NOTES.

[Edited by George A. Hill.]

#### Winnecke's Periodic Comet.

IN No. 3,083 of the *Astronomische Nachrichten* Dr. Haerdtl of Vienna publishes corrected elements for Winnecke's periodic comet, and also an ephemeris extending into next September. The comet will reach perihelion on July 1, be the nearest to the earth on July 9, when it will be only 11 million miles from the earth and attain a brightness 140 times that it had when found by Dr. Spetalerou March 18 last. The comet at the date of discovery was 72 million miles from the earth. The epoch of the ephemeris is for Berlin midnight.

	R.A.			Dec.	
	h	m	s	°	'
April 30	11	34	23	+	44 2
May 1		32	42		44 8
2		31	4		44 13
3		29	27		44 18
4		27	52		44 22
5		26	20		44 26
6		24	49		44 29
7		23	11		44 31
8		21	52		44 33
9		20	27		44 34
10		19	3		44 35
11		17	41		44 36
12		16	21		44 36
13		15	3		44 35
14		13	46		44 34
15		12	13		44 33
16	11	11	16	+	44 31

#### Comet Swift.

The following is a continuation of the ephemeris for comet Swift. This comet may prove to be a very interesting one, as the computations made seem to point to the fact that it is moving in a hyperbolic orbit. The observations at the present time do not extend over a sufficient interval to be absolutely sure of this statement, but as the comet is a bright one, it will probably give us a long series, when the question can be definitely settled. We have so few positive cases of comets moving in hyperbolic orbits that this one will receive at the hands of computers a very thorough dis-

cussion. The Rev. G. M. Searle, director of the Observatory of the Catholic University at Washington, has computed both hyperbolic and parabolic orbits for this comet. The difference between computation and observation for the middle places in the hyperbolic orbit is zero, while in the parabolic orbit it is + 15" in longitude and + 7" in latitude. The following is a continuation of the ephemeris published in No. 481 of *Science*.

	R.A.			Dec.	
	h	m	s	°	'
May 8	22	53	10	+	25 28
9		55	58		26 6
10	22	58	45		26 42
11	23	1	30		27 18
12		4	13		27 53
13		6	55		28 28
14		9	35		29 2
15		12	14		29 35
16		14	51		30 7
17		17	27		30 39
18	23	20	1	+	31 11

#### Comet Denning.

The following is an ephemeris for comet Denning. The epoch is for Berlin midnight:

	B.A.			Dec.	
	h	m	s	°	'
May 8	3	11	48	+	55 11
9		15	23		54 57
10		18	54		54 42
11		22	22		54 27
12		25	46		54 12
13		29	7		53 57
14		32	24		53 42
15		35	38		53 27
16		38	48		53 12
17		41	55		52 57
18	3	44	58	+	52 41

#### MR. PETRIE'S DISCOVERIES AT TEL-EL-AMARNA.

ONLY recently the news reached us of the discovery by the Direction of Exploration in Egypt of the tomb of King Amenhotep IV. (Khu-n-aten) at Tel-el-Amarna; and now, from another quarter, we hear of further important discoveries in the same locality.

The labors of Mr. W. M. Flinders Petrie, who has been working all winter at the excavation of the royal palace of Khu-n-aten, have been rewarded by a most unexpected find, one, indeed, that is unparalleled in the history of archæology. Lying on the ground, tossed in a corner among spoilt blocks of rough granite "Ushabtis," discarded by the artisans who had prepared the king's sepulchral furniture, lay the plaster cast, the mask, of the dead man himself, evidently taken immediately after his death by the sculptors employed to carve his statues. It is in an almost perfect state of preservation.

This extraordinary relic of one of the most interesting figures of antiquity lends unforeseen support to the view of the monarch's character suggested in my last article. According to Mr. Petrie, the face thus revealed, as it were, in the flesh, "is full of character. There is no trace of passion in it, but a philosophical calm, with great obstinacy and im-