CITY OF NEW ORLEANS · DEPARTMENT OF HEALTH
NEW ORLEANS, LOUISIANA 70126
DIVISION OF

Mosquito Control

GEORGE T. CARMICHAEL, ADMINISTRATIVE DIRECTOR
6601 LAKESHORE DRIVE, ON THE AIRPORT 241-2370

1969

Annual Report

MAYOR'S ADVISORY COMMITTEE ON MOSQUITO CONTROL

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George T. Carmichael
George T. Carmichael
Mosquito Control Administrator

RODNEY C. JUNG, M.D., PH.D.
DIRECTOR OF HEALTH

1969 ANNUAL REPORT

Five years ago the City of New Orleans started a Mosquito Control Program. Much had been written and said as to the "pro's" and "con's" of such an endeavor, with many people openly voicing the opinion that "nothing could be done about the mosquito." This action, by the City, was brought about by invasions of mosquitoes that had virtually paralyzed the entire area. Three years in succession the City had endured hordes of the pests that made the summer months unbearable.

There were promises made by the Mosquito Control Advisory Committee that an effective control program could be developed; that a noticeable reduction in mosquitoes would be felt in three to five years; that this could be accomplished at a cost of from 50 to 75 cents per person per year. This would be a great saving over the amount spent by individuals in their futile attempt to protect themselves from the invaders.

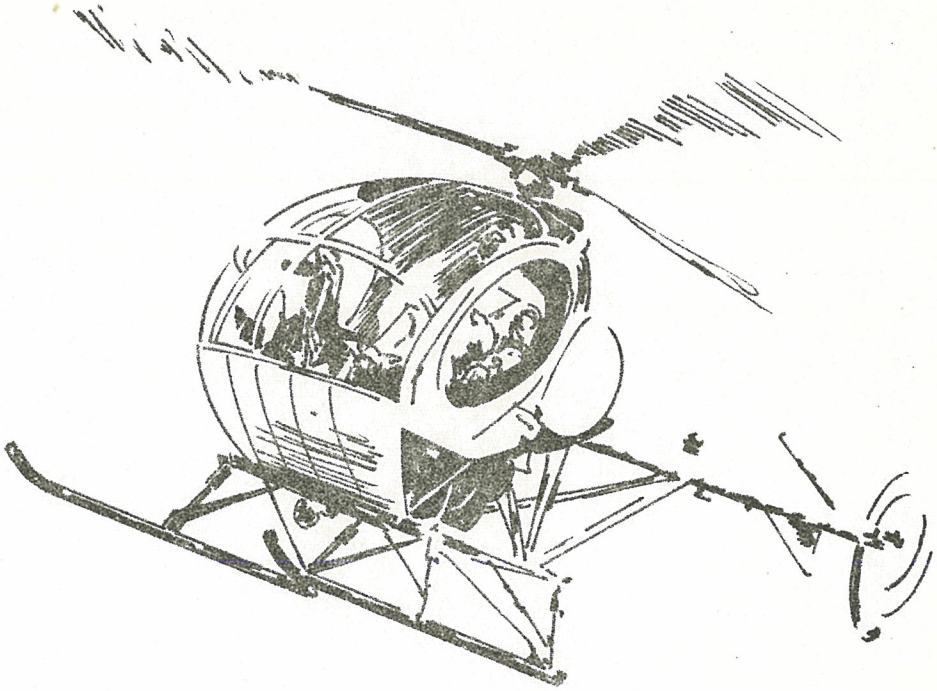
The Mosquito Control Program is now five years old, and we are happy to report that all promises have been fulfilled. The Orleans Parish Mosquito Control Program today is recognized throughout the United States as a model type program and our accomplishments are many. Invasions by our main enemy, the salt marsh mosquito, Aedes sollicitans, have not been a significant problem in the densely populated parts of our City during the existence of our Program. The outlying areas where mosquitoes have moved in, have been back "under control" in less than 7 days, their normal life span shortened by 5 to 7 weeks. The people of the Parish are constantly telling us how successful the control efforts are in their area. The veterinarians have also reported a noticeable decrease in heart worms in dogs since the formation of the Program.

The most successful accomplishment has been the mosquito control staff, for without them there would be no program. We have a dedicated staff of 24 permanent employees and 8 part-time, who have devoted not only their working hours but their total time to making the control program of Orleans Parish an organization of which they can be proud.

The contributions to the program by the Orleans Levee Board have greatly assisted our operation. The monetary contribution in the first two years enabled us to get an early start in the purchase of equipment, and the site on the Lakefront Airport has proven to be the ideal location for a program utilizing aerial techniques.

There are 25 "co-operators" who operate mosquito light traps for the City and 60 who operate rain gauges. The help we have received from these 85 people has been of tremendous assistance to us. The rain gauges help us locate the isolated showers that initiate the breeding cycle, enabling us to start treatments immediately.

It would be impossible to include all the City Departments, corporations, and individuals who have given assistance to the Program in its formative years, and continue to do so. However, special mention should be made of the Louisiana Surplus Property Agency, which obtained for us the C-47 aircraft and many other pieces of equipment and vehicles. This has allowed our budget dollars to go much further than they would have gone if spent on new equipment.

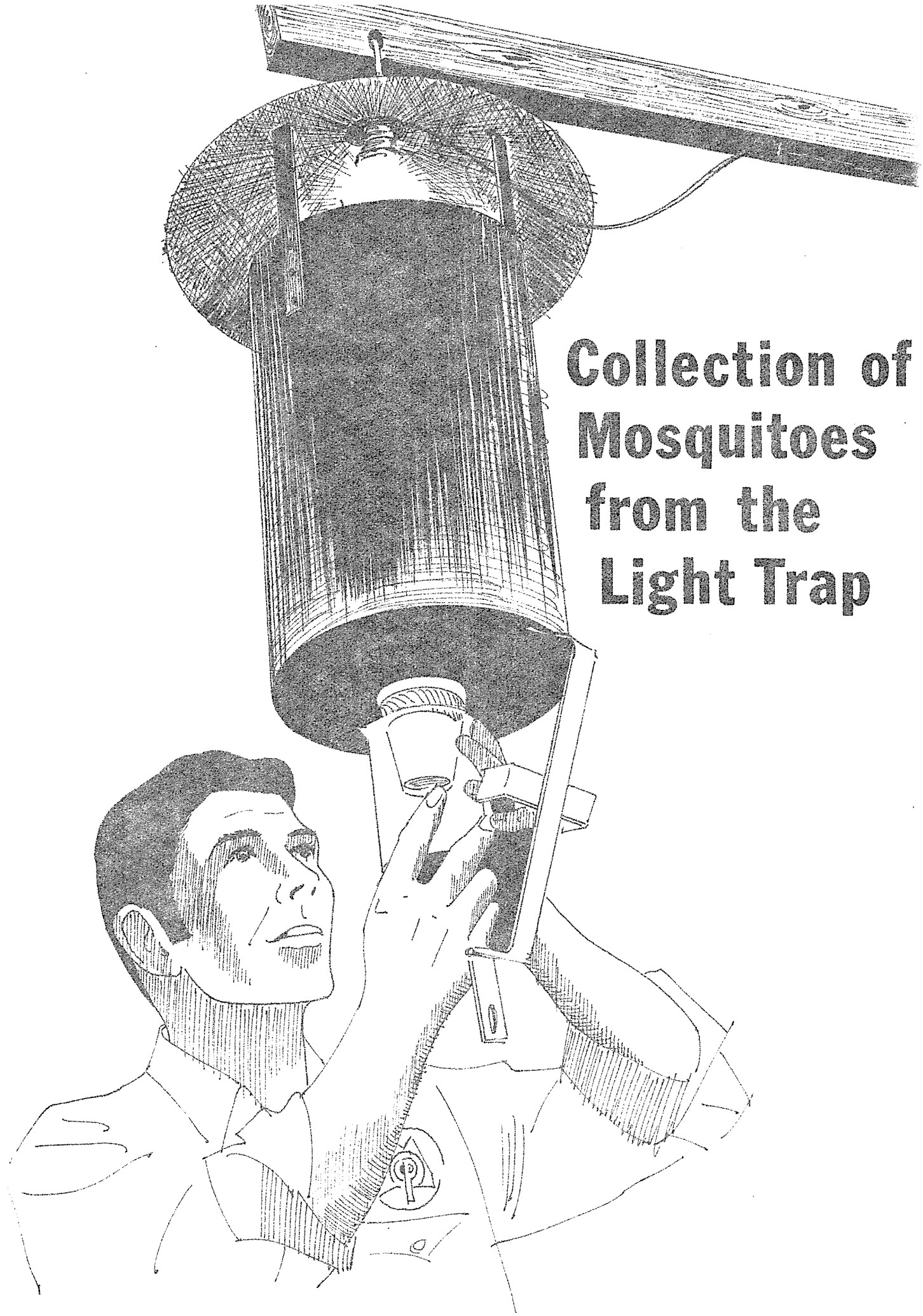


Field Survey
. . . Larvae

LARVAL FIELD SURVEY - 1969

Flooding a previously wet, but now damp or dried area, through rainfall or high tide is the trigger mechanism that elicits a response nature has planned far in advance. The gravid female mosquito contributes to the perpetuation of her species by responding to a network of biological stimuli and oviposits her eggs in a suitable area that will eventually provide the life sustaining water needed for her brood. Predetermination of this suitable ecosystem can be accomplished by intensive field survey activities.

Mosquito control inspectors must also respond to the rainfall and flood tides; early detection of our huge floodwater and saltmarsh broods is necessary to initiate our first line of defense. The immature stages of the mosquito lack the mobility of a mature adult and huge concentrations can be eliminated while they are restricted to the aquatic state of their life cycle. Field larval survey is geared to early detection of immature mosquitoes. The Helicopter is the tool that allows us the mobility and speed that is necessary to locate the larvae. Fixed-wing aircraft first fly the inspectors over the entire marsh area. Permanent records are kept, based on a weekly flight. When a sufficient amount of rainfall or a high enough tide has occurred, the new water is mapped in red and these areas are inspected by helicopter.



Collection of Mosquitoes from the Light Trap

ADULT FIELD SURVEY - 1969

Adverse climatic conditions, human error and the prolific nature of the mosquito will not allow us to depend completely upon a single phase control activity. In spite of the many larvae controlled, thousands more escape detection and subsequent elimination. These highly mobile adults are surveyed for by light traps and landing rate counts. Twenty-six strategic locations throughout Orleans Parish provide invaluable information twice weekly.

Mosquito migrations can be located and the direction of the source determined by adult density survey. Unless the breeding area dries up completely we will normally wait for migration of the adult mosquitoes to their normal resting and feeding areas before attempting treatment. Orleans Parish is surrounded by a levee system and these levees are a favorite gathering place for adult mosquitoes. Certain high grass and wooded areas will also harbor large quantities of these pestiferous hoards. A normal hatch will span over three days and it is very important that we are able to determine when the entire brood is hatched. Reinfestation will occur overnight if the brood is treated before all the adults have hatched. Adult density survey is what allows the mosquito control staff to coordinate the next line of defense. Adulticiding is accomplished by ground fogging and aerial spraying properly timed to the complete emergence, migration and activity cycle of the adult pest.

FIELD SURVEY OPERATION - 1969

Light Trap Operation

2659	light-trap collections	
923	man-hours on light trap collections	$ 2,324.62
14198	miles traveled @ 3¢ per mile	425.94
	Cost of light trap operation	2,750.56

Landing rate counts

769	man-hours on landing rate counts	1,995.68
4665	miles traveled @ 3¢ per mile	139.95
	Cost of landing rate counts	2,135.63

Truck trap operation

35	truck trap collections	
50	man-hours on truck trap collections	124.00
989	miles traveled @ 3¢ per mile	29.67
	Cost of truck trap operation	153.67

Identification of mosquitoes

122625	mosquitoes identified	
13517	larvae identified	
362	man-hours identifying mosquitoes and larvae	1,043.77
	Cost of identification	1,043.77

Light trap maintenance

467	man hours	1,251.80
1316	miles traveled @ 3¢ per mile	39.48
	Cost of light trap maintenance	1,291.28

Inspection and mapping

4462	man-hours inspecting and mapping	11,977.21
15379	miles traveled @ 3¢ per mile	473.79
59.9	hours fixed-wing inspection	1,055.02
20.9	hours Helicopter inspection	1,790.95
	Cost of inspection and mapping	15,296.97

FIELD SURVEY OPERATION (Continued)

Ground larviciding

642.5 man-hours larviciding	$ 1,792.36
2037 miles traveled @ 3¢ per mile	61.11
2171 gals. of diesel @ 11¢ per gal.	238.81
Cost of ground larviciding	2,092.28

CDC light trap operation

105.50 man-hours collecting mosquitoes	330.87
984 miles traveled @ 3¢ per mile traveled	29.52
Cost of CDC light trap operation	360.39

Resting stations

213.5 man-hours collecting mosquitoes	545.93
876 miles traveled @ 3¢ per mile	26.28
Cost of resting stations	572.21

Bird trapping

1007 man-hours trapping birds	2,878.70
3169 miles traveled @ 3¢ per mile	95.07
Cost of bird trapping	2,973.77

Sentinel chickens

597.5 man-hours on sentinel chickens	1,656.53
1418 miles traveled @ 3¢ per mile	42.54
Cost of sentinel chicken operation	1,699.07

Rain gauge maintenance

11 man-hours on rain gauge maintenance	29.64
184 miles traveled @ 3¢ per mile	1.35
Cost of rain gauge maintenance	30.99

FIELD SURVEY OPERATION (Continued)

Permanent control

469 man-hours on permanent control	$ 1,942.40
596 miles traveled @ 3¢ per mile	17.88
Cost of permanent control	1,960.28

General office work

3968 man-hours on general office work	14,799.21
Cost of general office work	14,799.21

Shop work

1043.0 man-hours on shop work	2,899.12
401.0 miles traveled @ 3¢ per mile	12.03
Cost of shop work	2,911.15

Miscellaneous maintenance

148.0 man-hours on miscellaneous maintenance	409.48
51.0 miles traveled @ 3¢ per mile	1.53
Cost of miscellaneous maintenance	411.01

Laboratory Evaluation

LABORATORY EVALUATION - 1969

Delineation of the mosquito problem is the end accomplishment for which larval and adult survey is striving. Verification of the results of field survey takes place in our laboratory. Mosquito larvae collected by our inspectors are identified in the lab, as to species and instar of development. This information is necessary to determine high priority treatment areas and to schedule the proper control measures. Thick grassy or heavily wooded areas receive consideration because their control measure must be enacted while the mosquito larvae are still in the third instar of development. Areas of less dense vegetation indicate a different treatment and this measure can be accomplished through the fourth instar and even through the pupal stage.

Adult mosquito identification is also accomplished by our taxonomist in order to give our staff the pertinent information needed to assign adulticiding activities. Light trap collections are in the office by noon and the results of the collections are circulated to the proper individuals by 2:30 that same afternoon. Concentrations of certain species in certain areas will indicate that ground fogging is the necessary tool to accomplish control. High concentrations of other species in the fringe areas of the Parish will indicate that aerial adulticiding is the more feasible method of treatment. The individuals who are responsible for interpreting this data must be well schooled on the entire life cycle of all the mosquitoes he is attempting to control.

ZONES ALGIERS- N. CENTRAL- SO. SHORES, MICHOUD-
S. CENTRAL- EASTERN- CHEF, L. ST. CATHERINE-

DATE 1969

LOCATION	TOTAL		AEDES		ANOPHELES		CULEX		CULIS.	MANS.	PSOR.	OTHER	OTHER	NO.
	MALE	FEMALE	SOLL.	VEX.	CRUC.	QUAD	QUINQ	SAL.	INOR.	PERT.	CONF.	SPP.	SPP.	COLL.
1. LOWER ALGIERS	589	8449	1/ 465	19/533	59/ 380	0/362	6/ 8	454/5895	44/ 737	0/ 42	0/ 1	6/26		86
2. MIDDLE ALGIERS	242	3290	0/ 43	31/560	1/ 32	0/ 17	9/ 5	145/2281	52/ 334	0/ 3	0/ 1	4/14		93
3. UPPER ALGIERS	65	616	0/ 12	15/179	0/ 8	0/ 3	1/ 3	35/ 343	8/ 59	0/ 3	0/ 1	6/ 5		78
4. CAFFIN AVE.	495	1683	0/ 12	56/484	6/ 27	0/ 2	86/41	266/ 964	55/ 132		0/ 1	25/20		33/97
5. VIEUX CARRE	336	602	0/ 16	41/132	4/ 11	0/ 1	116/56	145/ 326	21/ 49	0/ 1	1/ 0	8/10		99
6. IRISH CHANNEL	177	371	1/ 6	23/134	0/ 14	1/ 2	41/32	74/ 138	6/ 30	0/ 1		31/14		86
7. NAPOLEON	604	2311	0/ 19	135/1430	12/ 35	0/ 4	35/20	376/ 689	15/ 60	0/ 9		31/45		78
8. AUDUBON	145	255		20/ 120	4/ 6	0/ 1	57/24	45/ 85	7/ 13	1/ 2	0/ 1	11/ 3		76
9. CITY PARK	144	624	0/ 5	16/ 198	0/ 17	0/ 1	26/56	74/ 266	10/ 69	0/ 2	0/ 1	18/ 9		86
10 LAKEWOOD	215	966	0/ 5	36/ 509	1/ 26	0/ 1	39/29	125/ 334	6/ 47		0/ 1	8/14		92
11. WEST END	288	764	1/ 13	44/ 198	12/ 54	1/ 1	51/16	173/ 449	4/ 26		0/ 2	2/ 5		77
12. LSUNO	261	593	1/ 13	46/263	1/ 14	0/ 2	20/15	152/ 195	30/ 80		1/ 3	10/ 8		47/75
13. PEOPLES AVE.	292	2679	0/ 10	33/583	2/ 52	0/ 4	29/14	190/1219	34/ 788			4/ 9		94
14. EADS	363	440	0/ 1	25/ 106	0/ 2		278/216	50/ 88	8/ 26	0/ 1		2/ 0		60
15. GENTILLY E.	149	1331	3/ 85	40/425	5/ 82	0/ 3	32/26	55/ 610	12/ 65	0/ 27	0/ 1	2/ 7		82
16 LAKEFRONT AIRP.	1090	4020	5/ 48	205/1783	22/ 99	0/ 8	64/35	613/1467	151/ 515	2/ 24	0/ 10	28/31		100
17. LITTLE WOODS	550	8110	4/ 64	65/ 830	11/ 259	0/46	21/15	327/5834	113/ 728	6/ 299	0/ 2	3/33		82
18. VILLAGE DE L'EST	117	1061	2/ 47	44/ 285	2/ 43	0/ 4		30/ 247	39/ 412	0/ 12	0/ 1	0/10		74
19-BIENVENUE	508	2198	3/ 57	67/ 239	8/ 106	6/35	19/18	312/ 1533	54/ 65	0/ 9	38/ 36			91
20-MICHOUD	559	7855	13/ 490	14/ 539	51/1027	0/ 171	1/ 4	233/ 4073	40/386	70/ 795		137/370		96
21-POWERS-VGT.	1432	24645	3/ 325	6/202	32/1839	0/ 76	2/ 2	1018/19665	101/766	184/ 913		86/857		88
22-SOUTH SHORE	142	1374	0/ 81	5/ 42	18/ 255	0/ 5	6/ 0	102/ 876	8/ 65	1/ 35	0/ 3	2/ 12		65
23. CHEF MENTEUR	1239	12690	46/1010	46/366	168/2647	0/67	41/ 2	791/7888	51/205	91/413		5/ 92		91
24. GREENS DITCH	614	10094	14/2003	8/ 95	139/2277	9/206	194/22	202/4591	24/627	4/113	0/ 6	20/154		86
25. RIGOLETS	282	5579	8/ 486	10/166	52/ 949	0/29	4/ 3	159/3071	49/844	0/ 14	0/ 3	0/ 14		88
26. BONITA DR.	283	8844	0/ 71	30/4562	12/ 200	0/17	18/ 6	219/3811	4/ 64	0/ 76	0/ 7	0/ 30		42
TOTAL	11181	111444	106/ 5387	1081/14963	622/10461	17/1068	1196/668	6365/66938	946/7292	359/2794	2/ 45	487/1828		2242
PERCENT ♀			5%	13%	9%	1%		60%	7%	3%		2%		

ORLEANS PARISH MOSQUITO CONTROL

LARVAE COLLECTED AND IDENTIFIED - 1969

	As	Av	AN	Cq	Cs	Cr	CSi	Pc	Pf	Phw	Us	Atr	PUPAE	UNID.	TOTALS
JAN.	17			3	48	7	114						10		199
FEB.	16	38			88	30	109						20	21	322
MAR.	66	189	1	1	32	20	324						34	1	718
APR.	172	660	6	30	401	168	14						34	15	1500
MAY	78	1540	4	105	50	12			1	3			14	10	1817
JUN.		70	2	424	13	8							28		545
JUL.	90	438	7	293	4			8					90		930
AUG.	253	325	9	167	21			21		5	3	11	59		874
SEP.	358	29	1	76	8	1		29		1			19	3	525
OCT.	33			54											87
NOV.				19									2		21
DEC.	45	12			1										58
TOTALS	1128	3301	30	1172	716	246	561	58	1	9	3	11	310	50	7596

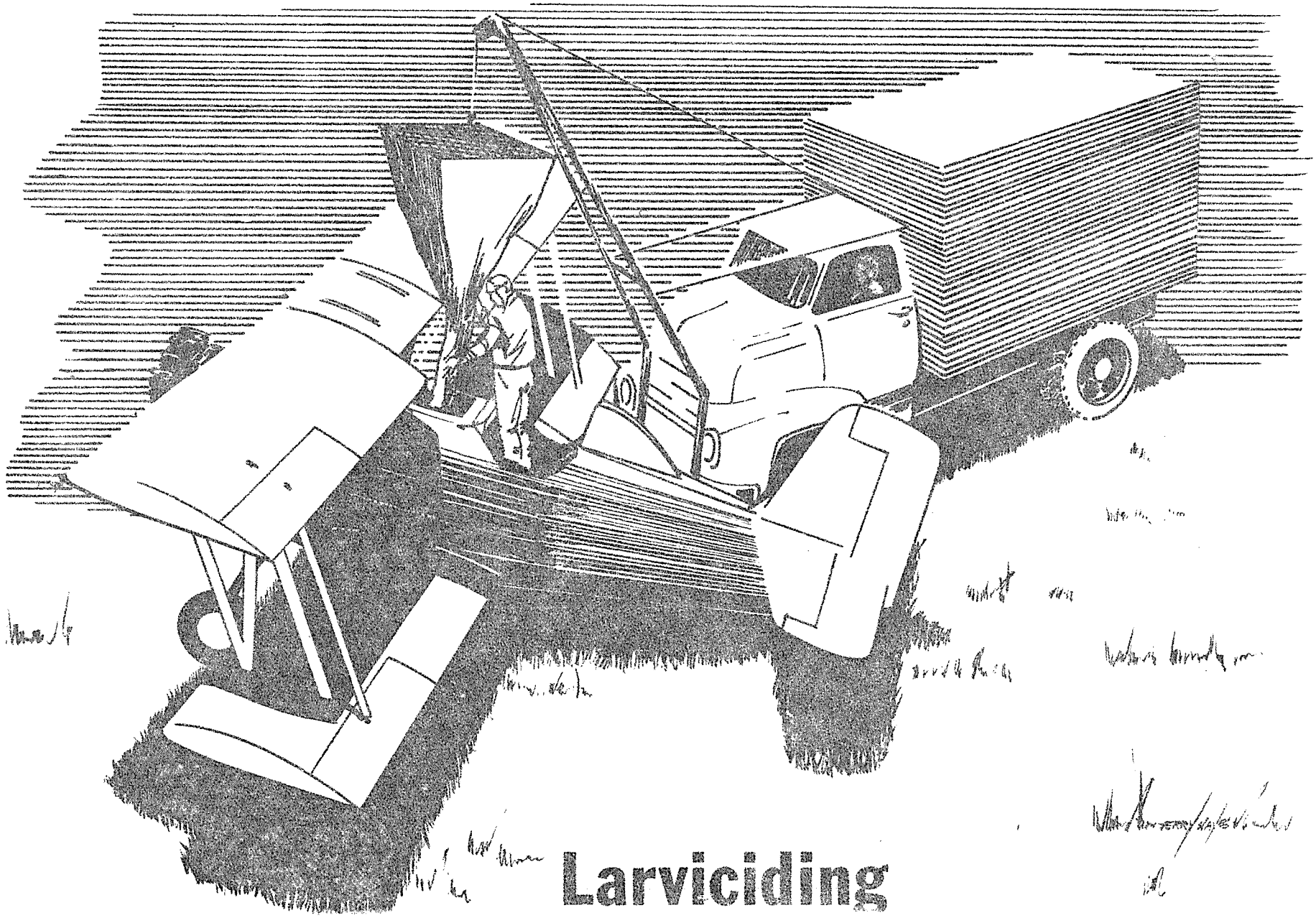
AUGUST & SEPTEMBER - LBJ Tests - *Culex quinquefasciatus* 2450

AUGUST - Humble Oil Test 3471

ORLEANS PARISH MOSQUITO CONTROL

STATION NO. _____ ADULT MOSQUITO COLLECTIONS DATE 1969

! of olls.	TOTALS		JAN.		FEB.		MAR.		APR.		MAY		JUN.		JUL.		AUG.		SEP.		OCT.		NOV.		DEC	
	2242		235		205		207		229		198		183		190		155		168		166		148		158	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
As	106	5387	7	54	12	68	3	2	7	154	10	485	3	567	15	635	23	1375	8	287	3	1336	15	399	0	2
.v	1081	14963	4	16	36	175	6	21	150	994	170	2929	69	4991	136	1827	190	2117	216	1112	65	586	39	186	0	
Nc	622	10461	20	109	41	251	5	61	30	714	83	2882	157	1666	37	853	30	940	20	679	108	1724	88	424	3	15
Nq	17	1068	1	29					0	14	0	26	0	136	0	35	1	90	4	305	9	297	2	127	0	
q	1196	668	2	11	0	2	0	5	1	5	14	11	142	63	459	139	182	98	130	79	174	143	76	105	16	
s	6365	66938	373	1827	635	7081	125	1113	724	11072	1283	16261	545	4436	62	1450	129	2417	477	6432	1193	5793	688	6919	131	213
Si	946	7292	508	2276	211	2772	157	325	34	55	0	3									0	6	10	776	26	107
p	359	2794							93	352	62	722	33	468	81	121	56	215	32	758	2	137	0	21		
c	2	45							0	1	0	2	1	15	0	14	1	8	0	3	0	2				
Na	0	147																	0	2	0	125	0	20		
t	1	105							0	1	0	8	0	2	0	7	1	40	0	25	0	22				
st	0	2									0	2														
r	175	115	23	18	28	36	38	40	67	12	9	0	5	0									0	2	5	
f	3	9							1	4	0	1	0	3			2	1								
nw	1	8									0	4			1	1	0	3								
(M)sp	300	1368							1	16	2	3	2	47	16	54	17	183	186	1016	76	46	0	2	0	
Sm	0	1					0	1																		
	0	6							0	1	0	3							0	1			0	1		
a	0	51											0	50							0	1				
p	0	1																	0	1						
e	7	15											1	3					2	1	3	9	0	1	1	1
- M	11181		938		963		334		1108		1633		958		807		632		1075		1633		918		182	
ls F		111444		4340		10385		1568		13395		23342		12447		5136		7487		10701		10227		8983		3433
AVERAGE - 50				4%		9%		1%		12%		21%		11%		5%		7%		10%		9%		8%		3%



Larviciding

GROUND AND AERIAL LARVICIDING

Mosquito larviciding activities depend not only upon proper timing and identification, but also upon communication with the treatment vehicle. Accurate designation of the breeding area will allow the airplane or the larviciding truck to return to the exact breeding spot that has been convicted. Without the visual record of aerial photographs, proper timing and identification of species would be of little value to mosquito larviciding activities.

Larviciding operations are conducted on a Parish wide basis. Pick up trucks with portable larviciding units dispense diesel oil mixed with surfactant, on the urban mosquito breeding areas. Hand operated pumps are also used to compliment the engine-driven portable larviciding units. The large, less accesable areas are treated by the division's airplane. Mosquito breeding areas with sparse vegetation are best treated with diesel oil mixed with surfactant, the breeding areas with a heavy canopy can only be treated with Paris Green pellets. Paris Green pellets are best suited for dense vegetation because they are dry and will not adhere to the vegetation. The only disadvantage of Paris Green pellets is the fact that the larvae has to ingest the pellet to be controlled and during the summer months the larvae need to feed less than three days to reach the pupal stage. The first instar mosquito larvae does not feed, the second and third instars are voracious feeders and part way through the fourth instar the larvae congregate and all feeding is ended until the adult emerges from the pupal stage. With so little time to accomplish control one can easily realize the importance of timing and communication.

GROUND AND AERIAL LARVICIDING - 1969

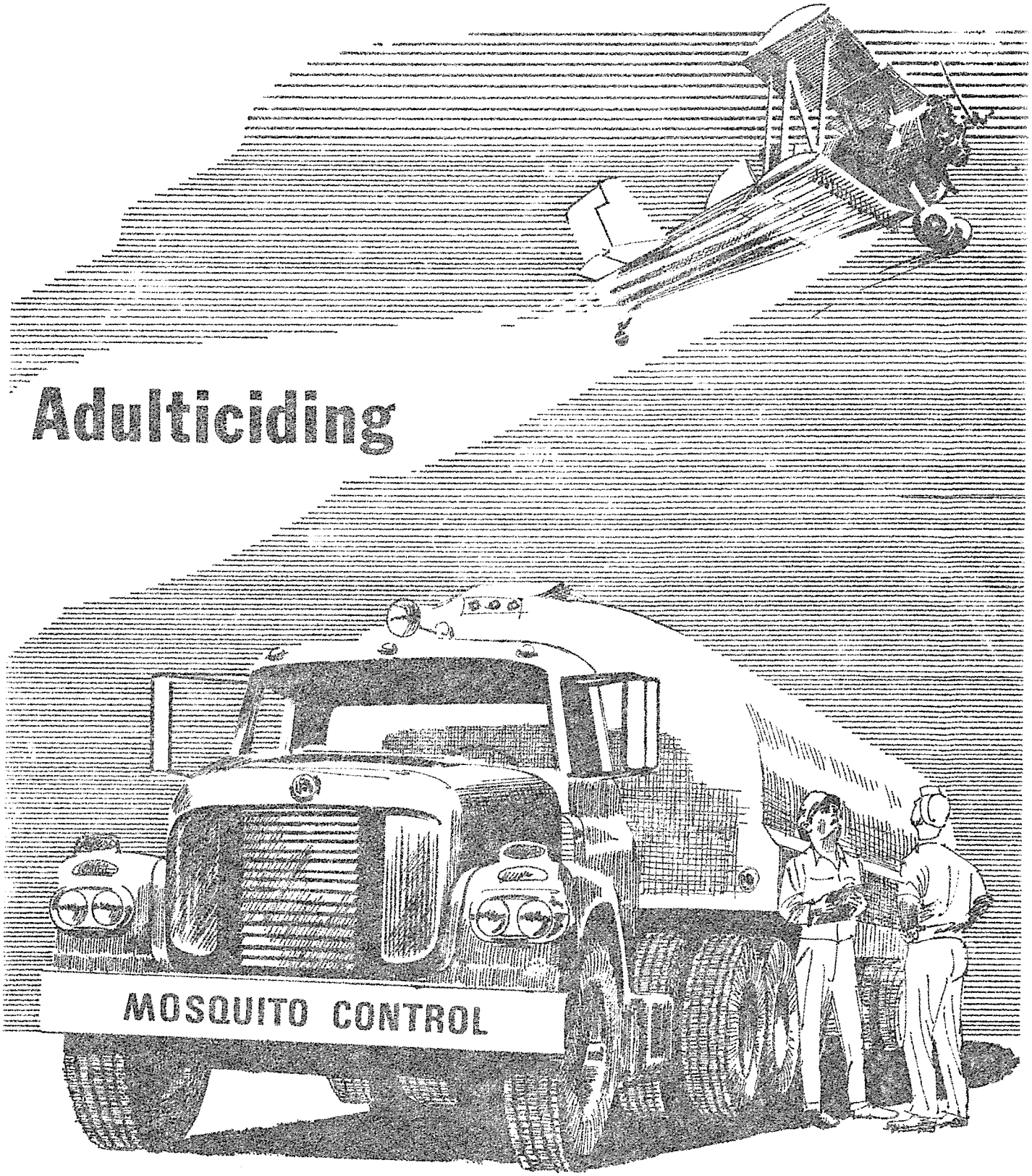
AERIAL LARVICIDING

	Larviciding Oil	Paris Green	Hours
JANUARY	0	0	0
FEBRUARY	0	0	0
MARCH	400 Gals.	0	1
APRIL	8,065 "	0	18.5
MAY	3,990 "	13,100 lbs.	18.5
JUNE	0	0	0
JULY	1,996 "	25,725 "	19.5
AUGUST	0	25,300 "	20.0
SEPTEMBER	300 "	0	4.5
OCTOBER	850 "	0	3.5
NOVEMBER	0	2,000 "	1.0
DECEMBER	2,000 "	0	7.0
	17,601 Gals.	66,125 lbs.	93.5

GROUND LARVICIDING

	FLOODWATER		DOMESTIC	
JANUARY	0		0	
FEBRUARY	0		0	
MARCH	425 Gals.	Larviciding Oil	7	Gals.
APRIL	175 "	" "	6	"
MAY	520 "	" "	13	"
JUNE	0		17	"
JULY	340 "	" "	14	"
AUGUST	400 "	" "	6	"
SEPTEMBER	627 "	" "	8	"
OCTOBER	57 "	" "	4	"
NOVEMBER	0		0	
DECEMBER	0		0	
	2544 Gals.		75	Gals.

Adulticiding



GROUND AND AIR ADULTICIDING - 1969

Analysis of data is a prime consideration in determining Adulticiding assignments. To effectively control adult mosquitoes we must first determine the species that is to be controlled. Then the proper control measures must be correlated with the activity cycle of the pest. Adulticiding assignments must consider that Culex mosquitoes are active at dawn and dusk and can be best treated during these high activity hours. The highly pestiferous saltmarsh mosquito can be active throughout the entire day and thus has a longer susceptible period. In most cases the peak of activity is the most feasible treatment time. Normal aerial activities are confined to outlying wooded areas. This is to attempt to relieve the pest pressure in recreation areas and to establish a buffer zone for the heavily populated urban sections of Orleans Parish.

The mosquitoes that filter through the buffer zones will now be controlled by a different method. Urban Orleans Parish is effectively depleted of adult mosquitoes by the familiar thermal fog trucks. This basic activity is very effective in an urban situation that is completely lined off with a gridwork of streets. In addition to the activity cycle of the mosquitoes climatological conditions also play a very important part in adulticiding. For the airplane and the fog trucks to be effective we should have very little wind and warm temperatures.

GROUND AND AIR ADULTICIDING (Continued)

1969 AG-CAT OPERATIONS

			Pilot Hours Adulticide
JANUARY	No aerial activities		None
FEBRUARY	$ 437.50	2000 Gal. 4%	13.0
MARCH	87.50	No 4%	None
APRIL	3,270.98	3460 " "	16.5
MAY	3,388.62	4090 " "	9.75
JUNE	1,506.80	3130 " "	8.0
JULY	3,465.90	4945 " "	18.0
AUGUST	3,453.00	7965 " "	33.0
SEPTEMBER	4,667.20	8302 " "	34.25
OCTOBER	5,261.05	4628 " "	22.5
NOVEMBER	4,508.22	5900 " "	28.0
DECEMBER	758.40	541 " "	2.5
	$ 30,805.17	45,161 " "	185.5

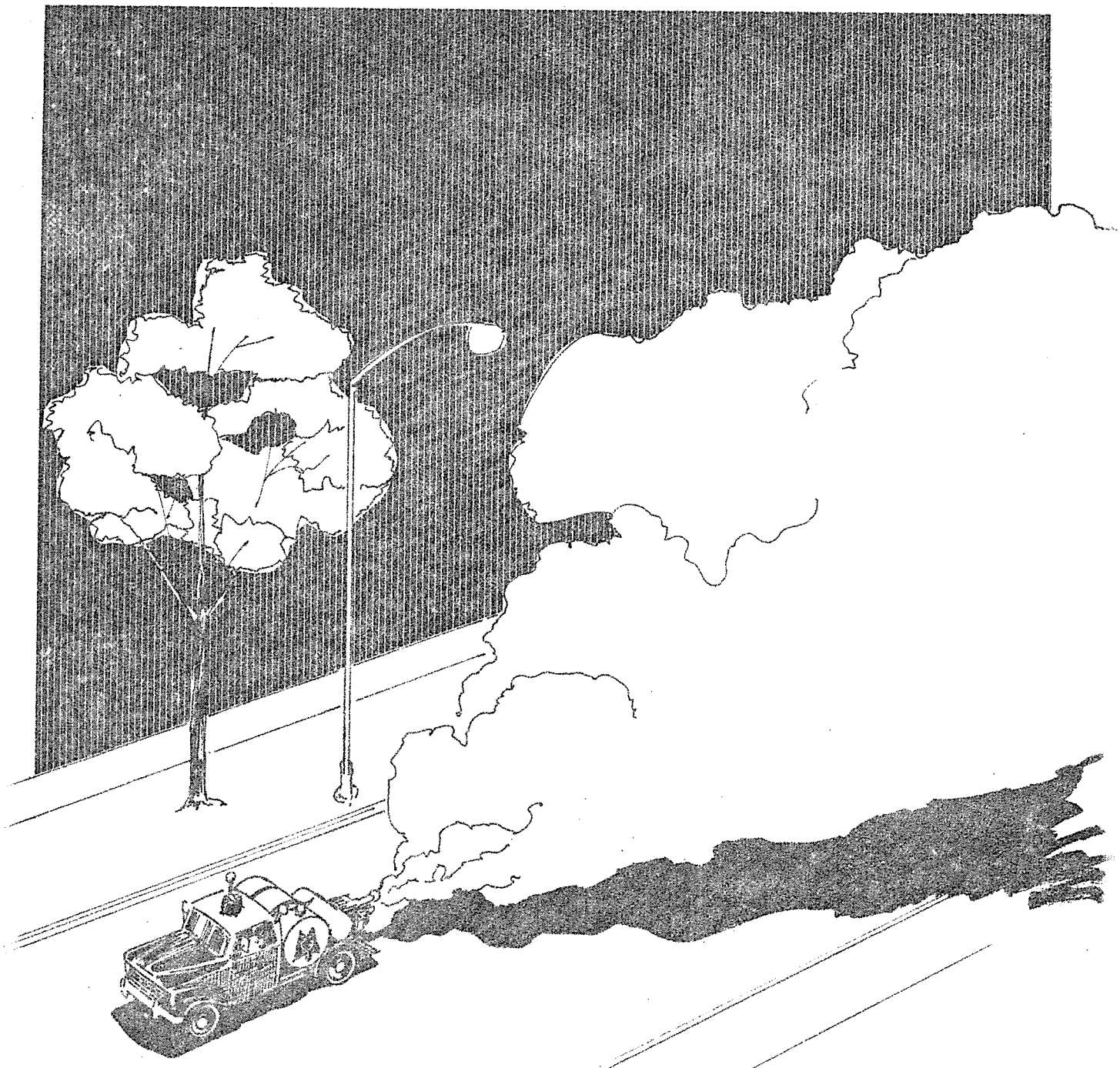
DC-3 LOCAL OPERATIONS

AUGUST	$ 1,400.00	56 Gal. Dibrom	1.0
OCTOBER	2,043.75	327 Gal. Tech. Malathion	4.0
NOVEMBER	937.50	150 " " "	2.0
DECEMBER	-	- - - - - -	1.0
	$ 4,381.25	533	8.0

Operation Expenses

$ 800.00	(8 hours @ $100.00/hr.)
64.00	(Pilot's pay)
4,381.25	(Malathion)
80.00	(Loading Cost)
$ 5,325.25	

Inspection flights, photo, directors' meetings, observations, etc. 37.25 Hrs.

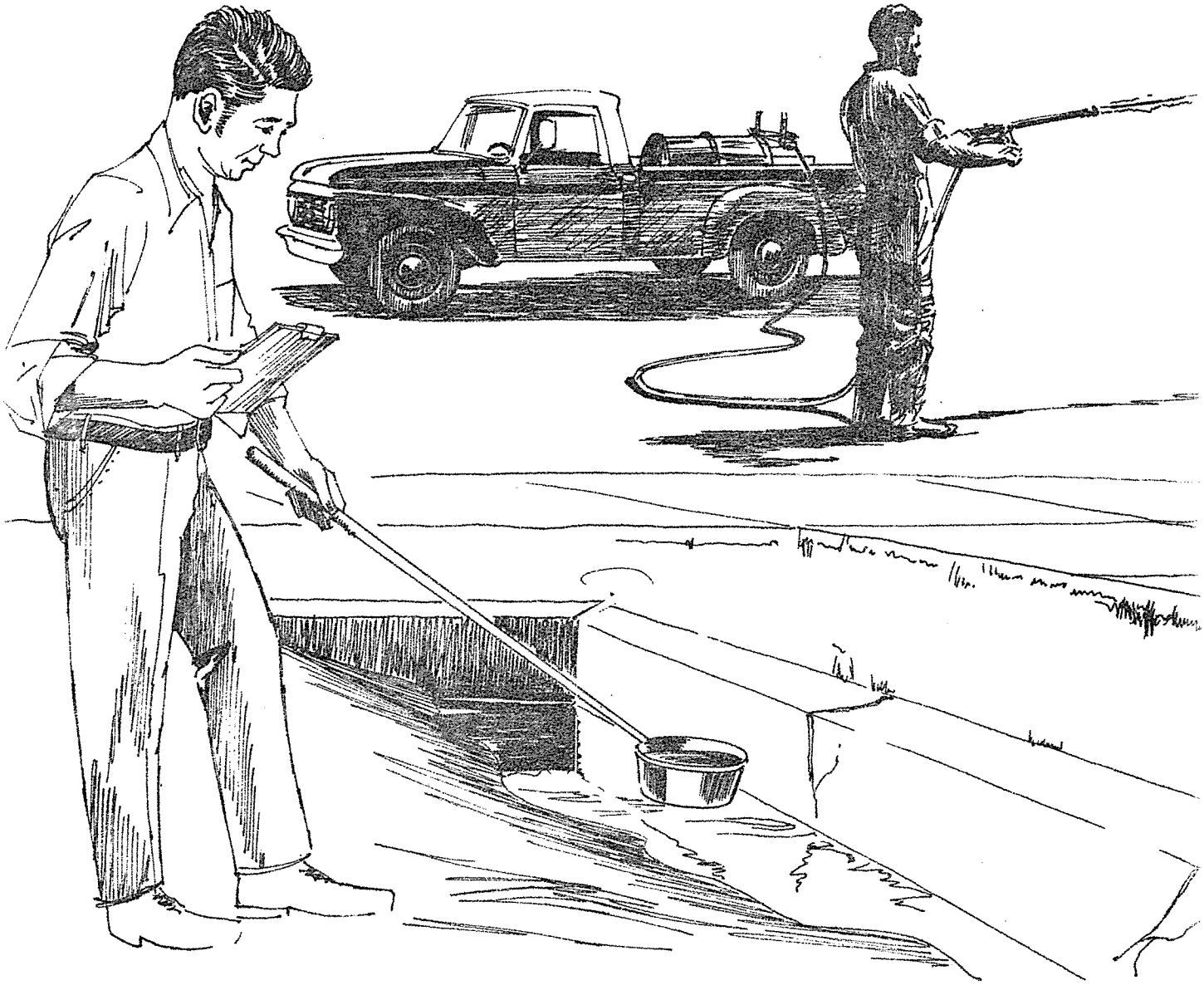


Ground Adulticiding

FOGGING REPORT - 1969

Man-Hours		1,738.35
Fogging Hours		1,203.55
Gallons Insecticide		51,104.0
Insecticide Cost	$	20,441.60
Labor Cost	$	4,285.77
Gallons Gasoline used		1,781.10
Cost of gasoline	$	435.18
Quarts of oil used		284.25
Cost of oil	$	15.80
Gallons of propane used		5,190.00
Cost of propane	$	613.10
Total miles traveled		14,606.80
Total miles fogged		6,042.75
TOTAL COST	$	25,791.45

Domestic Treatment



DOMESTIC MOSQUITO CONTROL - 1969

Domestic mosquito control is based on a somewhat different ecosystem than is the saltmarsh and floodwater mosquito control. Water is still the basic need for larval development but the adult Culex lays her eggs directly on the water's surface. In the case of Culex quinquefasciatus, water that is stagnate is the most attractive. So instead of fresh rainwater or fresh tidal flooding, we change our emphasis to standing water. During periods of extended drought "quinks" can be found flourishing in any ditch or swale that still contains water. Water contaminated with raw sewerage, garbage effluent and any other source of organic waste will attract the female "quink" to oviposit her eggs in that media. Sanitation is very effective in combating "quink" breeding, without the unsanitary media the gravid female has no place to oviposit her future generation.

Because of the prolific nature of Culex quinquefasciatus inspection and treatment should cycle every 7 to 10 days. As long as the water remains the females can deposit a potential brood every day. Much unlike the salt-marsh or floodwater mosquito whose eggs depend on nature for flooding, the female "quink" deposits her eggs directly in the proper media. Man-hours required for "quink" inspections can be scheduled in advance and regular inspections and treatments properly timed and executed. This particular mosquito does not find a light trap very attractive, thus larval inspection is the most accurate indicator of their presence.

DOMESTIC MOSQUITO CONTROL (Continued)

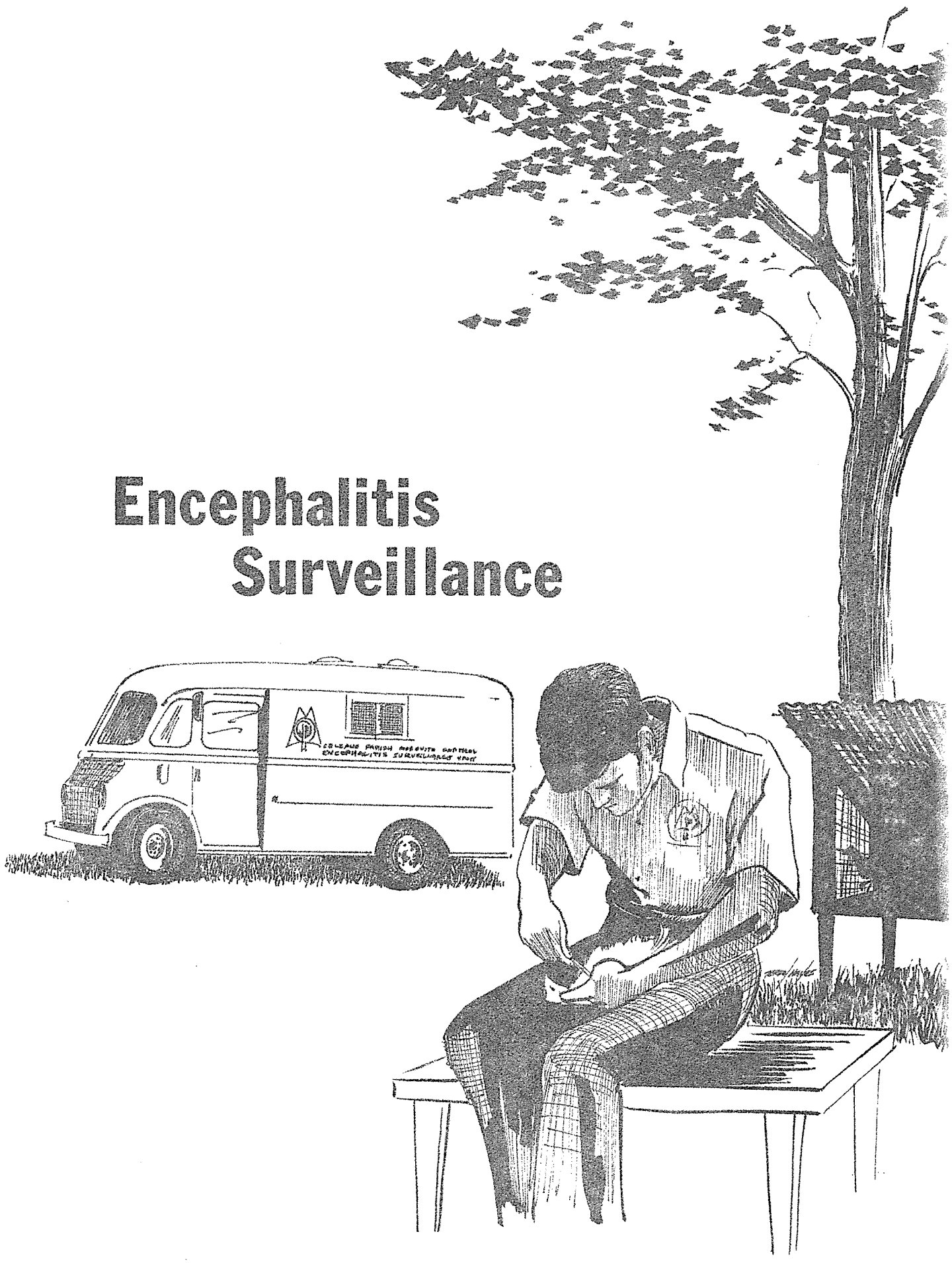
DOMESTIC FLOODWATER INSPECTION AND TREATMENT

4034	Areas inspected
745	Areas positive for breeding
3289	Areas negative for breeding
1090	Man-hours inspecting and treating
4760	Miles traveled
2544	Gallons larviciding oil used

DOMESTIC INSPECTION AND TREATMENT

2502	Areas inspected
321	Areas positive for breeding
2181	Areas negative for breeding
567	Man-hours inspecting and treating
3510	Miles traveled
75	Gallons larviciding oil used

Encephalitis Surveillance



ENCEPHALITIS SURVEILLANCE - 1969

Encephalitis Surveillance is conducted in Orleans Parish from March through September. Surveillance consists of trapping and bleeding wild birds, taking blood samples from our sentinel chicken flocks and collecting pools of suspected mosquito vectors. All blood samples are checked by the State Board of Health for encephalitis antibodies and virus isolations are attempted from the mosquito pools. Encephalitis is not primarily a disease of humans, but results from an overflow of virus activity in the bird population. High levels of virus activity in the bird populations coupled with the presence of a suitable mosquito vector could result in a human epidemic. Because of a 14-day incubation period in humans, the only early warning signal we can use is the virus activity in the bird population.

Strategic placing of the sentinel flocks will allow us to locate the area of virus activity. The wild bird population moves all around the city but the sentinel chicks remain in one location.

Positives in the sentinel flocks will give us a much better starting point at which to break the transmission cycle. In order to break the transmission cycle we would deploy all available larviciding and adulticiding equipment into the suspect area. Without the proper mosquito vector to transmit the disease from the bird population to humans, the epidemic will be broken. The virus isolation will yield the exact species that is responsible for virus transmission. A combination of wild bird bloods, sentinel chicken bloods and mosquito pools seems to be the only safe method to utilize for effective encephalitis surveillance.

ENCEPHALITIS REPORT (Continued)

MOSQUITO POOLS	NO POSITIVES
Culex salinarius	23
Mansonia perturbans	10
Aedes sollicitans	1
Aedes vexans	7
Aedes taenorhynchus	1
Total pools	42

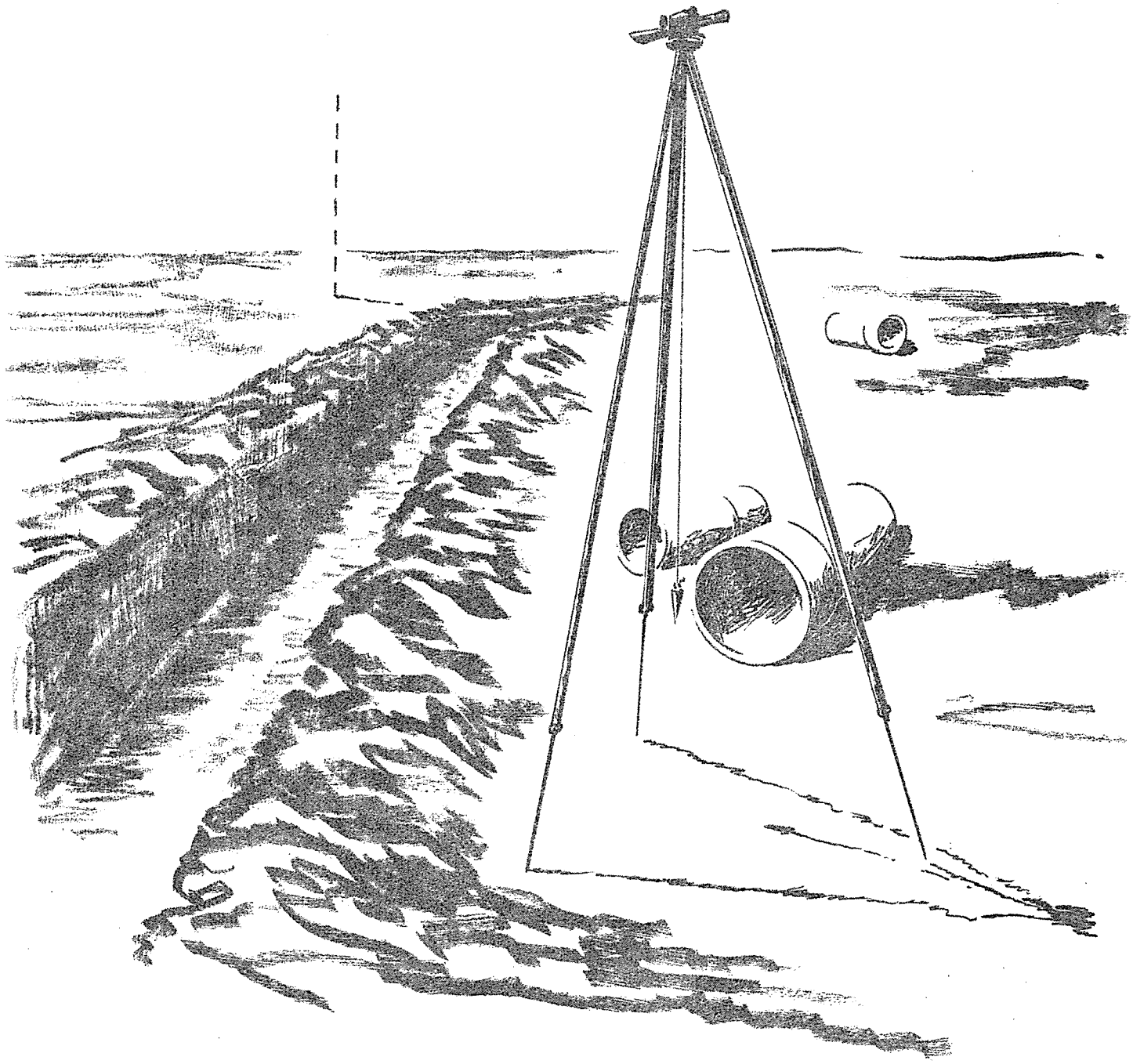
SENTINEL CHICKEN BLOODS	
Total bloods	472
Number of Positives	7
% of Positives	1.48%

WILD BIRD BLOODS	
Total birds	993
Number of Positives	
SLE	1
EEE	4
WEE	2
TOTAL POSITIVES	7
% of Positives	0.70%

TOTAL SPARROWS COLLECTED	683
Number of recaptures	54
% of recaptures	7.9%
% sparrows of total birds	68%

NO BLOODS WERE TAKEN DURING LATE AUGUST AND SEPTEMBER DUE TO HURRICANE CAMILLE.

Permanent Control



DRAGLINE REPORT

Permanent control, when properly located and scientifically executed, is the end product of mosquito control. Mosquito breeding areas are inspected and permanent records maintained in order that a priority for permanent control can be determined. This priority is established on the basis of breeding frequency, treatment frequency and proximity of population to the breeding area. Once an area is convicted as a chronic mosquito breeder and is designated as a high priority area, we must then determine the most feasible method of permanent control.

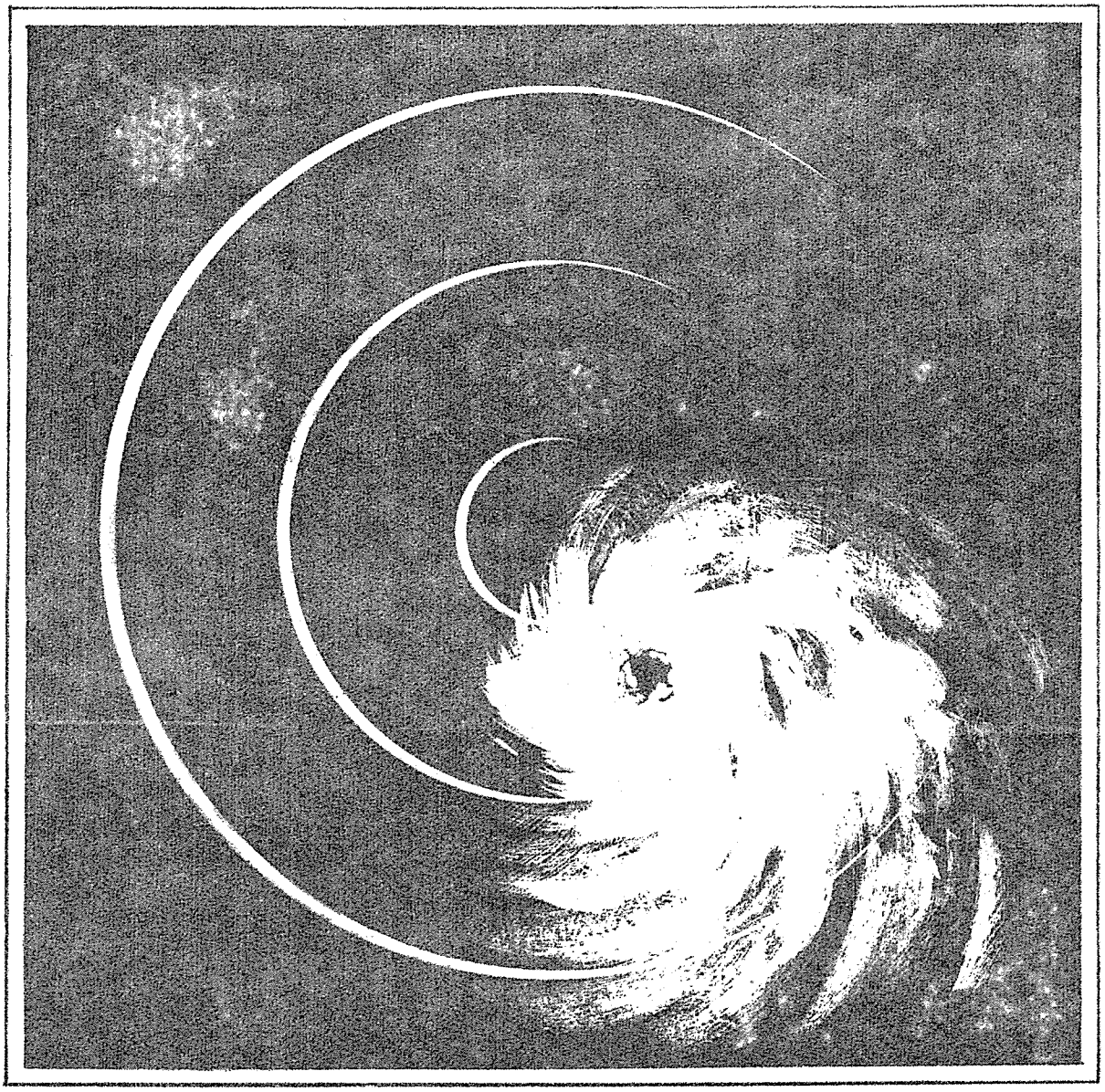
Water management through impoundment, drainage, increased tidal action and levee construction are some of the methods we can choose from to accomplish permanent control. In addition to controlling mosquitoes, we must also consider marsh ecology when undertaking such a project. In most cases we can enhance the native fauna and still achieve our permanent control. Drainage type permanent control must be able to remove all standing water in four days or less. During the hot summer months the saltmarsh mosquito is able to complete its life cycle in 5 days or less, that is why the time lapse is so important. Impoundment of water is very effective to combat floodwater and saltmarsh mosquitoes, as these mosquitoes lay their eggs in a dry area and the water prevents the female from ovipositing. Permanent water mosquitoes can be controlled by stocking the impoundment with predatory organisms to control these larvae. Increased tidal action provides the daily flushing that will wash the larvae out into larger bodies of water where the natural predators can reduce their numbers.

DRAGLINE REPORT (Continued)

Total hours		1117.0
Total dig hours		576.4
Per cent time digging		51%
Total linear feet dug		33,465.0
Total cubic yards dug		17,617.7
Gallons fuel oil used		735.0
Fuel oil cost	$	105.21
Salary cost	$	3,952.10
Reconditioning dragline cost	$	4,339.82
Miscellaneous operational cost	$	602.36
Total operational cost, 1969	$	4,659.67
Cost per linear foot	$	.14
Cost per cubic yard	$	.28
Average ditch size		3' x 5'
Linear ft. per digging hour		30
Cubic yd. per digging hour		16

"...CAMILLE

is a very strong and dangerous hurricane..."



OPERATION CAMILLE - 1969

Just as the weather bureau predicted, HURRICANE CAMILLE was a very strong and dangerous hurricane. On August 17th of last year Hurricane Camille came ashore just east of the town of Bay St. Louis, Mississippi, with winds peaking at 200 mph and tides in excess of 20 feet above normal. Destruction was unbelievable, multi-story buildings were leveled, houses were completely removed from their foundations leaving only a bare slab as evidence of their existence. There were 258 known dead, 68 persons missing and a 1.42 billion dollar loss.

Two days following the storm a meeting was held in Gulfport to decide on a plan of action. Since electrical power was non-existent and likely to be so for some time, the problem of fly breeding in perishable food was paramount, not to mention the mosquito breeding which was initiated by tide and rain. It was decided to begin spray operations immediately, using the DC-3 of the City of New Orleans, plus four C-123's of the Air Force Special Aerial Spray Flight. The plan was to quickly treat the hardest hit areas to curtail fly production before their numbers became too great. While this was being done, helicopters would transport evaluation teams to assess the problem and to provide data to determine area priority for all subsequent flights.

The Federal Aviation Agency was requested to declare the area restricted and closed to all air traffic not on official business. Actual spraying began on August 23rd, with the DC-3 operating out of New Orleans Lakefront Airport, spraying the counties of Hancock and Jackson, while the C-123's operated out of Keesler AFB, treating Harrison County, which was more suited to a multiple A/C spray technique. The four Air Force planes treated

Harrison County for 4 days before returning to Langley AFB. At this time, Mosquito Control's DC-3 accepted the responsibility for spraying all three counties. Nine days later two C-123's returned and began operations out of New Orleans Lakefront Airport.

At the end of 54 spray missions, requiring a little more than 100 air hours, the DC-3 had applied 6,000 gallons of Dibrom-14. In addition to the counties of Hancock, Harrison and Jackson, operations were also conducted in two other Mississippi counties and one Louisiana Parish as well as the islands located off the Mississippi Gulf Coast. The total area treated was one-half million acres. Results based on field observations, complaints and daily inspection reports indicate that overall fly control was quite satisfactory. Heavy fly populations were noted only in dump areas, here densities ranged from 300 per 1/2 meter squared to 10 per 1/2 meter squared. Outside dump areas concentrations were noted mainly at food store locations which averaged 10-15 flies per 1/2 meter squared. Difficulty in fly control was noted only in areas where flies had considerable shelter or during periods of relatively low temperatures.

In general, there was never a buildup of mosquitoes along the immediate coast. Problems were noted only in isolated fringe areas such as in the town of Picayune, where landing rates of Aedes atlanticus and Psorophora ferox reached 100+ per minute at mid-day. This was reduced by 90% when treated at 1 oz. per acre.